THE TIMES
Higher Education
SUPPLEMENT

DES to monitor giving of discretionary awards

by Frances Gibb

The Department of Education and Science is to monitor the allocation of discretionary awards by local authorities. In answer to a parliamentary question this week, Mrs Williams, the Secretary of State for Education and Science, said she was concerned by indications that the awards for next year would be sharply reduced.

Figures for 1975-76 indicate that about 47 per cent more was spent on some 50,000 discretionary awards. However, no later figures were available. Local authorities were free to make their own decisions both on the number and the level of discretionary awards, Mrs Williams said, and she had no information yet about their policies for 1977-78.

A meeting had therefore been arranged for later this month between officials of the Association of Metropolitan Authorities, the Association of County Councils and the Department of Education and Science, to discuss ways of monitoring discretionary awards.

Mr Bryan Davies, Labour MP for Enfield, North, had asked Mrs Williams if she was satisfied that the level of discretionary awards being made to students for 1977-78 was consistent with her policy to give priority to the education of the 16-19 age group.

There was anxiety in many quarters that next year these awards would be lower than many would wish, he said. The department should look for ways to give a more specific grant to local authorities and ensure that this aspect of policy retained the priority Mrs Williams had given it.

In answer to a request to look at the position of handicapped and disabled students, and to consider making their awards mandatory, Mrs Williams said she would examine the matter. One reason, she said, why local authorities might not always make sufficient awards for these students was that building designs did not include provision for them. "We have sent a circular asking local authorities to remember this when designing extensions to further education colleges and similar institutions", she added.

Mr William van Straubenzee, Conservative MP for Wokingham, said that anxiety about the reduction in awards was well founded, as many of them covered courses which were directly relevant to the country's recovery, such as aspects of the medical profession and business studies.

Mrs Williams said she could not *promise to make all discretionary* awards mandatory, as this would increase public spending. She would examine the system, however, and see if there were particular categories which the department might reconsider.

The National Union of Students met Mrs Williams, Secretary for Education and Science, this week to seek a commitment that no student would be forced to leave a course as a result of increased tuition fees in October.

Tuition fee occupations end

Most university and polytechnic occupations over Government plans to increase tuition fees ended this week. Many have set up joint student/staff negotiating bodies to ensure the new levels do not force students to leave courses.

Among the universities where some fee concessions have been made are York, which has agreed not to implement the new levels in special cases; Durham, which has given a commitment that no student will be obliged to leave his course; and the London School of Economics, which has agreed that the school should set aside £70,000 for a hardship fund.

At City University, the court has agreed that tuition fees for part-time students should not be increased over the 1976/77 level, and that, in distributing hardship money, priority be given to self-financed students on course.

At Brunel students now have an agreement in principle there will be *no discrimination in fees for new* home and overseas students, but this has to go before council.

Brunel has already agreed that fees will not be increased for self-financed students mid-course. Dundee, Bath and Northern Ireland Polytechnic have also agreed to this.

The Association of University Teachers has requested a meeting with Mrs Williams on the whole question of tuition fees. The decision to increase them was "one of the most ill-conceived and damaging decisions yet made in higher education by the *present Government*", a spokesman said this week.

Urging a reversal of policy, the AUT says the increases will inevitably reduce numbers among some of the most valuable and highly-motivated groups of students, and shift the activities of universities away from the proper balance of both teaching and research.

Dr Clifford Butler, vice-chancellor of Loughborough University, has written to the Minister urging that there be no fees differential between home and overseas students, and *that self-financing students should* not be asked to pay more than in the year they entered a course, except to allow for inflation.



Eyeball to eyeball: Mrs Williams and Mr Derek Robinson, SSRC chairman.

Applications for research 'are slipshod'

Social scientists were chided by Mrs Williams, the Secretary for Education, last week for the "indescribably slipshod" way in which some of them applied for public money for research.

She told members of the Social Science Research Council during a visit to its headquarters that they must do what she did with grant applications to the Department of Education and Science—throw back ill-formulated proposals even if they came from academics of repute.

"I have seen applications for research money (some of them come to my own department) which look as if somebody has whistled in the bath and then simply tried to put the notes down on paper afterwards; and I am bound to say that some of them come from institutions which have most distinguished names and from individuals of very *senior academic standing*" she added.

Mrs Williams hinted she would like to see the SSRC become more involved in studying the effects of Government policy.

● Two new members have been appointed to the council. They are Sir James Dunnett, former permanent secretary at the Ministry of Labour, and Mrs Ann Lumping, a journalist and wife of the Granada Television producer, Mr Brian Lumping.

Decline of part-timers to continue

by David Walker

Numbers of part-time students in polytechnics will continue to decline as these institutions concentrate on advanced work, according to figures underpinning this year's Rate Support Grant.

The figures show the ratio of advanced to non-advanced students in the polytechnics increasing from 12-to-one to 28-to-one between 1975 and 1979-80. Similarly, part-time evening and day students will decrease significantly as a proportion of all students in the polytechnics.

At the same time the importance of advanced work in institutions other than the polytechnics—for example—is not projected to increase. The ratio of advanced to non-advanced students in these further education colleges will remain roughly the same until 1980.

These figures come from the report on last year's Rate Support Grant negotiations between the local authority associations and the Government. The same figures have also been fed into the Government's *public expenditure survey*, the results of which were recently published in the annual White Paper.

The figures are necessarily provisional, but they are given weight by a recent statement by Mrs Williams, Secretary for Education, that part-time day student arrangements should be increased in the polytechnics.

The RSG figures project an increase in absolute terms of part-time day students by 1980, but a striking fall in the importance of part-time work in polytechnics as a whole. The ratio of full-time and sandwich students to part-time students is planned to be reduced from eight-to-one to nearly 10-to-one.

The figures are a blow to the hopes of institutes of higher education that plan to expand their degree provision. Although only a small growth in the absolute number of advanced course students is planned, further education colleges planned, the importance of such work as a whole will shrink slightly.

As the expenditure White Paper sketched out, the growth over the next few years is supposed to be further education outside the polytechnics. The RSG figures show full-time and sandwich students in colleges increasing by only 55,000 in the next four years. The figures take the form of "full-time equivalents". Part-time students in these colleges will hardly increase at all. So expansion is planned in full-time sub-degree work.

Rate Support Grant, Eighth Report, £2 from the local authority associations.

OU plans link with California

The Open University is planning to enter into a major academic collaboration with the University of California, involving the production of 16 television programmes for use in Britain and America.

The deal, which is expected to be formally agreed in May, has been under discussion by the two universities and the BBC for nine months. The University of California is to pay $100,000 to the Open University towards the cost of productions.

Academics from both universities are to take part in the programmes which will be filmed in Britain, America, and other parts of the world if necessary. When produced the films will be used as an audio-visual component of a third level OU course, Understanding Space and Time, due to be introduced in 1979.

The University of California plans to use the films within its own courses programmes at the campuses of Berkley, Santa Cruz and Irvine, where filming is also likely to take place.

Law dean may resign on ruling

Professor Musa Mazzawi has offered to resign as dean of Central London Polytechnic's law school following a Council of National Academic Awards' decision to suspend the intake to the college's BA law degree for one year from September.

The CNAA ruling, which is being challenged by the polytechnic, is a condemnation of the polytechnic's decision to exceed the maximum intake figures laid down by the council in the three years the course has been running.

In September 1975 the intake reached 75, 15 more than the CNAA maximum. At the beginning of the current academic year 92 first year students were enrolled instead of the 75 laid down by the council.

Professor Mazzawi, head of international law, maintains that demand for places on the BA law *degree is high. Last year more than* 2,000 applications for places were received and the number of applications for 1977-78 are likely to be higher.

Composer teaches

Sir Michael Tippett, the composer, has taken up a week's residency at Lancaster University where he will give a programme of composition classes, lectures and tutorials. He will also receive an honorary doctorate of music from the university.

Patterns of equality

The title of Dr Guy Neave's book on the post-war development of higher education in Europe, *Patterns of Equality*, not *Fairness and Inequality* as stated in *The Times* last week.

NEXT WEEK

The state of Oxford University. Richard Hoggart on changing directions in higher education. Profile of Duncan Davies, chief scientist at the Department of Industry.

Royal Institute of Chemistry centenary.

Kent law clinic.

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Top medical schools' protest makes DHSS change mind

continued from page 1

Authority, which has one of England's biggest teaching and research *commitments, revealed* that as a direct result of the DHSS letter an unscheduled meeting of the University Liaison Committee had been arranged at short notice.

A spokesman for the authority said, however, that it had already been decided that teaching and research would get as much money in real terms in 1977/78 as in 1976/77. The RAWP or SIFT formula had been applied rigidly there would have been a £2½m shortfall in funds for six teaching hospitals.

Dr Lowe also welcomed the DHSS letter because it restored some of the communication between medical education and the health service.

He proposed the establishment of a national liaison committee on which the DHSS, the University Grants Committee, the Committee of Vice-Chancellors and Principals, and perhaps the Department of Education and Science, would be represented at the highest level.

The health service's present policy-making machinery failed to take educational factors into account, Dr Lowe said. The RAWP proposals were such an obvious threat that universities had made a fuss in time, but they might fail to spot something less obvious but just as educationally damaging in the long run.

This idea was challenged by Dr A. J. Lane, North Western Region's medical officer and, like most people from the North-West, "a self-*confessed RAWPist*". "Isn't it strange that whenever London interests are threatened we have a call for national committee? " he asked.

Medical intake to increase, page 3

Italy shaken by riots

continued from page 1

to war dances and harmless happenings. Others try to protest at the economic crisis by forcing cinemagoers to let them in at half price and robbing shops.

Signor Cossiga said the following day that the students had had their chance to show whether they were capable of demonstrating peacefully and now the government was going to get tough. Later he indicated in parliament that if existing laws were not sufficient he would consider emergency measures.

Whatever immediate action is taken it seems unlikely however that the trouble will die down for a long while. The causes—in particular the prospects of an empty and workless future—persist.

No one really knows how many unemployed graduates and other young people there are. The Labour Ministry's total figure for unemployed is 1,350,000 and it has no indication how many of these are young people.

The government's statistical office, on the other hand, puts the total at 777,000, of whom 640,000 are under 30. There is no figure for graduates. But an association of unemployed graduates estimates the total as three million.

Much unemployment is concealed by the fact that many school leavers sign on at university simply because they cannot get jobs and therefore count as students rather than workless.

The prime minister's office, meanwhile has issued a statement saying it was essential that parliament should approve emergency measures. This is assumed to include a £266m scheme to create jobs for 420,000 young people. It has still not come before parliament.

Meanwhile there was disappointment and disillusionment among many students who had taken part in the march. They felt its purpose had been defeated by the violent elements.

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Czechs use university entry as 'reward for conformity'

by Annabel Ferriman

Major allegations of political discrimination in selecting students for university in Czechoslovakia have been made by the "Charter 77" group of dissidents.

In a document which has just reached the West, the dissidents claim that higher education is being denied, on a mass scale, to the families of those active in political, scientific or artistic life in 1968.

The group, which is calling on the Czechoslovak Government to implement in full the United Nations Declaration of Human Rights, maintains that universities are refusing to accept children of supporters of the democratization process, even though these children were only 10 or 11 years old in 1968.

One proof of discrimination and protectionism cited by the group in what is called "Document 4" is an official Ministry of Education directive regulating entry procedures in the academic year 1976-77.

"According to this directive, an applicant whose matriculation results were clear firsts in all his exams, who got a first in his written entry exam and at the same time in his oral, but who did not fulfil the class political criteria", is placed lower in the university entry order than an applicant whose average matriculation result was 2.7 (that means, for example, no firsts and more thirds than seconds), failed the written entry exam and achieved an average grade in the oral, but fulfils the "class political criteria".

The document states: "Entry into secondary schools, and universities, is now *determined not only by the* objective assessment of the ability, talent and potential of the candidate, and by the correct use, development and distribution of talent, but it is predominantly used as a reward for political 'activism and conformism', and as a punishment of parents for their political views, if they are out of step with current political practice.

"These politically motivated, discriminatory sanctions thus affect the most sensitive of human relations, i.e, the relations between parents and children. They intimidate parents and children, and demand superficial conformity and hypocrisy. . . .

"This discrimination, efficiently implemented, though never publicly acknowledged by the Government, is in direct contradiction to the proclamations that the socialist society respects ability in all its citizens and gives them all the means of fully developing and using them.

"Instead of talented applicants, the schools and universities today accept below-average students who are, or whose parents are, politically active, *and conformist, either* sincerely or hypocritically, and who are willing to accept and support everything that the present Government proclaims."

The signatories of "Charter 77" Document 4, claim that the selection procedures have a demutilizing effect on the "moral profile" of the young and on the teachers, who are forced into a moral dilemma because refusal to implement the directives would threaten their jobs. The procedures also affect the quality of graduates.

The document is based upon an appeal made to the Federal Assembly of the Czechoslovak Socialist Republic by Professor Venek Silhan, an economist who was acting deputy to Alexander Dubcek during the Russian invasion of Czechoslovakia. It was made last November, but has also only just reached the West through the Palach Press Agency.

Both documents point out that discrimination in education contravenes the United Nations, Declaration of Human Rights, which Czechoslovakia signed in 1968. The Declaration was reconfirmed in the concluding act of the European *Security and Cooperation Confer*ence held in Helsinki in August, 1975, and became part of Czechoslovak law on March 23, 1976.

Professor Jan Patocka and Professor Jiri Hajek who drew up Document 4, claim that the selection procedures have a demutilizing effect on the "moral profile" of the young and on the teachers, who are forced into a moral dilemma because refusal to implement the directives would threaten their jobs. The procedures also affect the quality of graduates.

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Professor Jan Patocka and Professor Jiri Hajek who drew up Document 4, demand the revocation of all existing discriminatory Ministry of Education directives.

Extracts from Professor Silhan's letter will be published in *The TIMES* next week.



A Czechoslovak student remonstrates with a Russian soldier in the streets of occupied Prague nine years ago.

OU in talks on transfer scheme

by Sue Reid

The introduction of a credit transfer scheme, allowing the movement of students between the Open University and traditional university courses, is to be examined at a key meeting today between the Committee of Vice-Chancellors and Principals and Open University representatives.

The meeting will be the first of a series of regular liaison sessions between the CVCP and the Open University. It follows similar negotiations between the Council for National Academic Awards and the Open University about transfer procedures, which are now nearing completion.

Four universities — Lancaster, Kent, Salford and Sussex — already have agreements allowing Open University students with three, or in the case of Kent two, relevant credits to transfer to the second year of a degree course.

Today's talks, although preliminary, are to be attended by Sir John Habbakuk, CVCP chairman and vice-chancellor of Oxford University, and Sir Walter Perry, vice-chancellor of the Open University. The talks could lead to an expansion of credit transfer agreements on a national basis.

A CVCP spokesman said this week that other issues, including academic collaboration and research possibilities, would be discussed.

SSRC grants itself £½m

Nearly £500,000 worth of current research grants has been awarded by the Social Science Research Council to itself.

An official answer to a question in the House of Lords by Lord Vaizey, professor of economics at Brunel University, showed that members of SSRC subject committees held grants worth about £390,000 from the SSRC. Members of the council itself had a further £110,000.

Lord Vaizey put a series of questions about SSRC affairs in recent weeks, asking about the qualifications of its officials, its administrative costs, and the research activities of members of the council.

Awaiting written answer is a question of his asking: "Why it is proposed to increase the expenditure of the SSRC when the country's major need is to support manufacturing industry."

University grant cut by less than 4%

Mrs Williams, Secretary of State for Education and Science, was expected to announce the long-awaited universities grant for 1977-78 in a *written answer* in the Commons yesterday.

Although the figure was not available when *The TIMES* went to press, it is known that the grant and the extra income received from increased tuition fees will represent a cut of less than 4 per cent in real terms in support for universities.

Allen heads SRC

Professor Geoffrey Allen, professor of polymer science at Imperial College, London, is to be the next chairman of the Science Research Council. It is understood that he will take over from Sir Sam Edwards, who retires in October.

UGC warning on 'lost horizons'

by Frances Gibb

The universities are suffering a deep sense of uncertainty which can be removed only by the restoration of a longer planning horizon, the University Grants Committee says in its annual report for 1975/76.

In an indirect attack on the Government, the committee says that the universities' financial system, which encouraged forward planning, has been seriously damaged by successive short-term decisions related to changing *national pressures.*

"This lack of any clear basis for forward planning, however spartan, has been more obvious than the decline in the value of the universities' grant, it says.

The value of universities' income per student (recurrent grant, fee income and equipment grant) fell by 13 per cent between 1972 and 1977, compared with the original expectation in the quinquennial settlement of a 2 per cent fall.

The economic situation had to be acknowledged, but if it had not been for the restraint on growth of academic staff salaries, substantially higher grants would have been needed to maintain the same level of activity.

The university system remains a good one, the report says. The last 20 years had produced impressive facilities, and first degree standards remained competitive with those elsewhere, although often achieved in a shorter term. Consequently the cost per student, bearing in mind the low wastage rates, was low.

"The attitude of students we have met has been strongly identified with their universities and their studies. The staff and administrations, in conditions of growing difficulty, are facing 'economies' with determination that the university purpose shall survive and new initiatives emerge even in a period when they must be at the expense of activities elsewhere."

It was a tribute to the reputation of British universities that increasing numbers of students from all over the world sought to enter them.

But, at the same time the last year had seen a down-turn in a 20-year growth which was unlikely soon to be resumed, the report adds.

The capital programme was the lowest for 20 years, and probably the lowest in real terms in peace time since the 1930s. A substantial decline was expected after Robbins, but many vital needs remained, especially libraries and residences.

At the most recent reckoning, the report says, available space in universities was used at more than 90 per cent capacity—and much of it at more than 100 per cent.

One of the most serious problems facing universities in terms of capital spending was the financing of work required under the Fire Precautions Act 1971 and the Health and Safety at Work Act 1974. This might add up to about £40m., of which £11m-£12m. was urgent. It would be many years before such money was available.

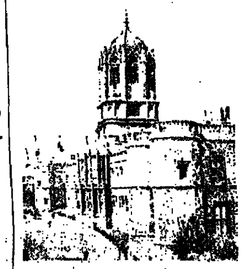
Much of the committee's attention was taken up with the needs of medicine and engineering, both in view of national priorities because of the large part—perhaps 40 per cent of the total—of university expenditure which they claim.

Because of expansion, costs in medicine had been heavy, but the proportion of women applicants and entrants continued to grow. In engineering, there were marked signs of a stronger demand. Extra numbers could be taken at low cost because of the staff and facilities available.

University Grants Committee: Annual survey 1975-76. Command 6750 HMSO. £1.

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Jews feel threatened by 'college campaign'

by Judith Judd

Jewish students believe that a co-ordinated anti-semitic campaign is being waged in universities and colleges.

Mr Simon Caplan, chairman of the Union of Jewish Students, claimed this week that two identical motions had been put before at least 17 student unions this term. "We feel this campaign is being organized centrally by anti-Zionist organizations and that it represents an increased threat to Jewish students", he said.

"York, Salford, Warwick and Lancaster university unions have all passed motions expelling Jewish societies on the grounds that they are Zionist and therefore racist.

"Elsewhere a other motion has been passed which does not involve expulsion but which condemns Zionism as racism.

"There is a fine line between what is anti-Zionist and what is anti-semitic. Some of what has happened has bordered on the anti-semitic. At Salford, for instance, Jewish students have been prevented from using the union facilities."

Last week the University of Manchester Institute of Science and Technology Jewish Society served a High Court writ on the UMIST students' union to prevent them from debating a motion that "Zionism is racialism".

The writ claimed that the wording of the motion contravened the union's constitution. It is possible, however, that when students return next term, attempts will be made to alter the constitution.

Mr Stuart Benson, chairman of the institute's Jewish Society, said the motion would almost certainly have gone through because of the high number of Arab students at UMIST.

Although the Middle East issue has been raised in student unions throughout the country, the "anti-Zionist" motion has been rejected by six unions.

The National Union of Students has no official policy on the issue, and an anti-Zionist motion tabled by York and Salford for next week's conference has not been given any priority. Mr Trevor Phillips, an executive member, said: "We feel that there should be more debate at local level before the union discusses this nationally."

Mr John Owen, president of Salford University students' union, denied that the Jewish Society had been expelled from the union. "It is not true that they cannot use the union facilities. They simply thought it was true.

"I think they are suffering from a persecution complex."

Student union officials at York, Lancaster and Warwick also denied that university Jewish societies had been expelled from membership of their student unions. A Lancaster spokesman emphasized that the union had only recently guaranteed the right of the Jewish Society to exist on campus.

Big increase in number of students in 10 years

Mr Frank Hooley, Labour MP for Sheffield, Heeley, asked Mrs Williams, Secretary of State for Education, in the Commons to state the total number of full-time students in universities and colleges of education in the academic years 1966-67 and 1975-76.

He also asked how many full-time and part-time students there were in further education colleges in those years, and how many full-time students there were in the polytechnics in 1970-71 and 1975-76.

Mr Gordon Oakes, Minister of State overseeing higher education, issued the following table covering full-time and sandwich course students except where part-time students are specified.

	Autumn term ('000)		
	1966/67	1975/76	1976/77 (estimates)
Universities (United Kingdom):			
Arts	84	135p	n.a.
Science	105	133p	n.a.
Total	189	268p	280
Polytechnics (England & Wales):			
	1970/71	1975/76	1976/77 (estimates)
Arts	32	63	n.a.
Science	26	33	n.a.
Total	60	98	113
Former colleges of education (England and Wales):			
	1966/67	1975/76	1976/77 (estimates)
Initial teacher training courses	84	87	56
Other colleges of further education (England and Wales):			
	1966/67	1975/76	1976/77 (estimates)
Full-time and sandwich courses	202	300	319
Part-time	1,514	1,465	1,425

n.a.=not available; p=provisional

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Dr Hoare: masterwork at 80

'Lone wolf' Cecil Hoare honoured

by Clive Cookson
Science Correspondent

The 85th birthday of Dr Cecil Hoare, described as "the most eminent protozoologist of his time", has been marked by the publication of a *Festschrift* in his honour.

A new species of protozoon has been named after him, too. It is Trypanosoma cecili, a parasite discovered in South American caymans (alligators) by Dr R. Lainson, of the Instituto Evandro Chagas in Brazil.

Dr Hoare's life work has been the classification and study of parasitic protozoa, particularly the trypanosomes that cause sleeping sickness in man and wasting diseases in animals. It forms the basis of a search for a vaccine for Chagas' Disease (South American sleeping sickness) which is now being undertaken at the Wellcome Research Laboratories.

He has been actively associated with the Wellcome organization for 53 years, and is still working in the Wellcome Museum of Medical Science in London.

In the opening paper of the *Festschrift*, Dr A. J. Duggan, director of the Wellcome Museum, writes: "It is difficult to believe that Cecil Hoare retired from his official post with the Wellcome Organization in 1957, because he immediately thereafter devoted a decade of his life to his master work, *The Trypanosomes of Mammals*, which was finally published after he had attained the age of 80".

Dr Hoare was born in Holland and educated in Russia. His academic career began in the zoology department of the Imperial University of St Petersburg, but it was interrupted by the Revolution, which he spent in captivity until the British Government undertook his repatriation in 1920.

"It is unlikely", Dr Duggan writes, "that such a long succession of fruitful discoveries as those made by Cecil Hoare will ever be repeated during the lifetime of a solitary investigator. He is one of the few 'lone wolves' remaining in science."

Festschrift in Honour of Cecil Hoare, FRS, can be obtained from the London School of Hygiene and Tropical Medicine, Keppel Street, London WC1. Price £5.

Centre for rights in education

London University Institute of Education is to mount a new post-graduate degree course concentrating on the rights of parents, teachers and students in education. Work for it will be coordinated by a centre for rights in education, the aim of which is to bring together teachers and researchers interested in this field.

The degree will have a core of law, philosophy and history together with three options: the rights of disadvantaged groups, the rights of women and the conflict of rights between parents, the state, teachers and students.

The centre for rights in education is one of several interdisciplinary centres being established in the institute. A centre for political education was established last September.

Polytechnic staff oppose Teesside merger plan

Staff at Teesside Polytechnic are opposing a merger scheme with Teesside College of Education on the grounds that it would give the college too much importance. The scheme, devised by representatives from the college, the polytechnic and the local authority, would divide the resulting institution into three sections one of them the college.

But, although it supports the merger in principle, the polytechnic's academic board has rejected the working party's report. It wants the college to become a sixth faculty of the polytechnic.

Dr Alan Oswald, branch chairman of the Association of Polytechnic Teachers, which has also opposed the report, said there was concern among staff that the three divisions would be of disproportionate size, particularly if teacher training numbers had to be further reduced.

"We feel that the working party places undue emphasis on the college of education and too much emphasis on the polytechnic," he said.

Staff were also angry about the lack of consultation before the report was drawn up.

The working party comprised four polytechnic representatives, four from the college, four lecturers and a local authority member. The local authority and college members backed the proposals.

The authority has not yet taken a final decision on what the new institution's structure should take, and there are to be further consultations.

Mr Kenneth Holmes, principal of the college of education, said the plan would retain the identity of teacher education and allow it to develop and diversify, for example in the field of further education.

Graduates should take jobs as technicians DES chief says

Graduates should be regarded as a source of technicians as well as technologists, Mr James Hamilton, Permanent Secretary at the Department of Education and Science, told a careers convention this week.

Mr Hamilton, who was opening the Thames Valley Engineering Careers Convention at Reading University, said there was nothing wrong with finding employment at technician level after getting a degree.

The convention was organized jointly by the Department of Industry, the Council of Engineering Institutions (CEI), Berkshire Careers Service, Reading University, and the Government-backed PETI Committee. It began with a symposium attended by 150 representatives of local educational and engineering concerns, many of whom carried on to man a big two-day careers exhibition.

The convention chairman, Mr Peter Clee, expressed disappointment that only 1,500 youngsters attended the exhibition out of 30,000 in the Thames Valley area. One school claimed that of a sixth form of 160 only one pupil was interested in an engineering career.

Professor Peter Dunn, of Reading University Engineering Department, called for more flexibility, specialization throughout and higher education. In the "baby power" situation, children were taking decisions would limit their future a They also provided an opp for teachers in secondary ed education to communicate industrialists—"It's extraordi rarely that happens."

The CEI is attempting to communications by setting regional panels of experts main fields of engineering, schools and help with advice.

"We really are an extraordinary country", Mr Hamilton said. "half our population is fou only one chartered engine thousand is a woman. If by vention does nothing more than made a few more girls to eng engineering, it will have a purpose very well."

Student jobs crisis threat

Student unemployment is reaching unprecedented levels and might, if unchecked, threaten the fabric of democratic society, Mr Charles Clarke, president of the National Union of Students, warned last week.

Launching a new NUS report on youth unemployment, Mr Clarke spoke of his dangers of political disenchantment among students who left college without a job. He called for a two-year guarantee of employment for students and the choice of a job or further training for 16-year-old school leavers.

In the report the NUS reinterpreted existing figures for university and polytechnic students to show joblessness six months after graduation at 9 per cent and 15 per cent respectively. Unlike figures issued by the Central Services Unit, these include students in temporary jobs.

The NUS conclusion, that student unemployment was now much higher levels than for school leavers, underpinned its programme for integrating all Government youth joblessness programmes.

Whatever the Government did, the NUS said, it should not use compulsion.

Better careers guidance in schools and colleges was needed, and teachers should have more experience of working life. A programme of full access to day-release for 16 to 19-year-olds should begin at once.

The alternative was growing apathy and depression among young people. Mr Clarke said.

Youth Unemployment. NUS Memorandum, 3 Endsleigh Street, London WC1 0DU.

Occupation to go on

Students at North Staffs Polytechnic last week [illegible] continue their three-week occupation of offices and halls on the college's Stoke sites in protest over the level of representation on the technic's governing body.

The students have [illegible] motion of no confidence in the directorate and the governors are also calling on the Department of Education and Science to institute an independent inquiry into the running of the college.

At a general meeting the students to stage a one-day strike today and organize a series of [illegible] throughout the polytechnic in addition to the occupation.

Earlier this month they [illegible] halt their occupation of the [illegible] at Stafford after the governors maintained that the [illegible] would be in [illegible] examinations for engineering which students are now [illegible] normally.

Two student representatives on the college's board of governors. Since the dispute began the student union members have been allowed to attend governors' meetings as observers.

Correction

The Handbook of the Scottish Institutions is published by the Committee of Principals and Directors of the Scottish Central Institutions and is available from Oswald, Paisley College of Technology, Paisley, Renfrewshire.



A breath of Celtic culture—but students at Liverpool can no longer choose it.

Liverpool to end Celtic studies 'on entirely academic grounds' despite growing interest

by Frances Gibb

Liverpool University is to close its department of Celtic studies at the end of September because it is failing to attract a sufficiently high standard of students.

The decision, which was made in March, 1975, was reaffirmed last month after an eleventh-hour appeal to senate by members of the department.

Mr H. H. Burchnall, the registrar, said: "We felt students of an appropriate quality were not forthcoming, and Celtic was taught very well at a number of universities—not least the University of Wales."

Grounds for the decision were entirely academic and not financial, he added.

Dr N. J. Williams, head of Celtic studies, said the decision was against his better judgment. "I am disturbed that the only English university which provides undergraduate courses in Celtic should be hell-bent on removing this provision."

Nationally, applications for Celtic were rising; interest was also growing internationally. The decision had been taken on the grounds of the quality of the first few entries after the degree course had started, he said. Not many students knew about it, although the department had offered Celtic studies in some form since 1908.

Dr Williams, who was appointed after discussions on possible closure of the department had begun, submitted alternative proposals aimed at attracting more students. They were that the syllabus, with its emphasis on Welsh, should be replaced by a broader course in Celtic studies.

The policy committee of the arts faculty rejected these proposals on the grounds that the course would not have sufficient depth; that there were insufficient members of staff to teach it; that the library did not have sufficient resources; and that it would probably only double the intake over 10 years.

This committee recommended that the department be phased out, a decision rejected by the majority of the full board of the arts faculty, then agreed by the senate's academic planning committee.

A factor that may have adversely influenced the decision, according to Dr Williams, was that the department had no immediate representation there and was therefore unable to present its case. Another was that the two members of staff, one full-time and one part-time, were on short-term contracts. The two students at the department will have finished their studies at the end of next term.

Biophysics experts among new Fellows of Royal Society

by Clive Cookson
Science Correspondent

The growing prestige of biophysics is illustrated by this year's Royal Society elections. Three of the new fellows are working in the field.

Of the traditional science subjects, chemistry gains six FRSs, and engineering, biology and physics five each. No other subjects have more than two names on the list.

Three of the new fellows are Sussex University academics. Cambridge, Oxford and Durham universities, and University College London, have two each.

Two scientists working in Aberystwyth have been elected: Professor John Thomas, head of the chemistry department at the University College of Wales, and Dr John Cooper, director of the Welsh Plant Breeding Station. Aberystwyth now claims the highest density of FRSs in the country, after Oxford and Cambridge.

Dr Isabella Muir, head of the biochemistry division at the Kennedy Institute of Rheumatology in London, is the only woman in the list of 42.

Eight scientists working overseas are included (four from the United States, two from Australia, and one each from India and Canada). Another eight are attached to non-university institutions, including three in industrial research: Dr Peter Duncumb of Tube Investments Research Laboratories in Essex; Dr William Strang, technical director of BAC's Commercial Aircraft Division in Bristol; and Dr Alfred Spinks, research and development director of ICI.

The full list is:

Richard Adrian, reader in experimental biology, Cambridge University; Professor Donald Anderson, biology professor, Sussex University; Professor Eric Ash, professor of electronic and electrical engineering, University College London; Dr Alec Bangham, head of biophysics at the Babraham Animal Physiology Institute, Babraham, Cambridge; Professor Brian Bleaney, head of the Oxford University department of materials; Professor Peter Bishop, head of physiology department, Sydney University; Professor Martin Birt, geophysics professor, Durham University; Professor Edward Boyse, cancer professor, Cornell University.

Mr Edward Broadbent, Royal Aircraft Establishment, Farnborough; Professor Colin Brown, biophysics professor, University of East Anglia; Professor Stanley Cartwright, physics professor, Sussex University; Professor Cyril Domb, chemistry professor, King's College London; Professor Peter Duncumb, Tube Investments Research Laboratories, Hertfordshire; Professor Brian Flowers, head of theoretical physics department, Oxford University; Professor Jeffrey Goodenough, physics professor, Sussex University; Professor Peter Gray, head of chemical engineering department, Queen's University, Belfast; Professor Jeremy Knowles, chemistry professor, Harvard University; Professor Daniel Koshland, biochemistry professor, Michigan University; Professor Peter Lloyd, mathematics professor, Sussex University.

Dr Bingham Moorbath, department of isotope geology, Oxford University; Professor Patricia Muir, Kennedy Institute of Rheumatology, London; Professor Norman Pirie, biology professor, Long Ashton Research Station, Bristol University; Professor Peter Pirie, chemistry professor, York University; Professor Geoffrey Pollock, head of chemical physics department, Southampton University; Professor John Pringle, Cambridge Laboratory; Professor John Rowlinson, chemistry professor, Imperial College London; Professor Gobindrao Sankaranarayanan, biophysics professor, Indian Institute of Science, Bangalore.

Professor John Sinclair, head of biochemistry department, Nairobi University; Professor Alfred Spinks, chief scientist, Imperial Chemical Industries; Professor John Smith, Nuffield professor of anatomy, Oxford University; Professor Neil Sutherland, head of biology department, Sussex University; Professor Colin Thompson, physics professor, Sussex University; Professor Alfred Tipper, physics professor, Queen's University, Belfast; Professor William Tuddenham, head of the Royal Aircraft Establishment's structures department, Farnborough; Professor John Vincent, physics professor, University College London; Professor Geoffrey Wilkinson, chemistry professor, Imperial College London; Professor Durham Wilkinson, engineering professor, Cambridge University; Professor Peter Williams, electrical engineering professor, Durham University; Professor Derek Wood, electrical engineering professor, Cambridge University.

How industry is helped

Industry and commerce earn at least £100m a year by exploiting inventions by university staff, according to the Association of University Teachers.

In a strongly-worded defence of universities' contribution to industry, sent to the Prime Minister last week, Mr Laurie Sapper, general secretary of the AUT, says that the work of universities often goes unmentioned in public speeches. "It is not widely known that universities make a substantial contribution to the industrial field through their research and education."

During 1975-76, he says, more than 500 inventions by university staff were patented through the National Research Development Corporation, which is concerned with research developments with potential for industry or commerce. Among the top 10 major licence revenue earners, five have come from the universities.

Industry and commerce in the private sector pay for their apprentices, skilled and semi-skilled workers either directly or through Industrial Training Boards. But their professional workers (engineers, scientists and technologists) are trained by the universities.

At a very conservative estimate this represents a direct contribution of some £150m, and only a fraction of this is paid in the form of sponsored studentships by industry in the private and nationalized industries, Mr Sapper says.

The letter lists examples of university research which has a practical application to industry, including the development of an electric bicycle at Cambridge, which is likely to have running costs of about 1p for 20 miles; the use of electro-osmosis in bleeding in Southampton, which reduces the time taken to drive piles in clay by up to 50 per cent; and an ambisonic sound system at Reading University.

University law courses 'need new approach'

by Marcel Berlins

Strong criticism of the content of university law courses was voiced at a conference on the role of the lawyer in public service, organized by the Institute of Judicial Administration in Birmingham last week.

The brunt of the attack was that law degrees were geared largely to the student wanting to become a practising barrister or solicitor. Those who might want to become lawyers in central or local government, or in the administration of justice were badly served by the courses available.

The conference was told that in practice only 60 per cent of law graduates entered the professions, yet the requirements laid down by the legal professional bodies dominated the content of most law courses.

Professor Patrick McAuslan, of the University of Warwick, said that English law schools had failed lamentably to educate lawyers to perform legal advice functions and to understand the policy aspects of law.

There should be much more policy-oriented teaching, he went on. Instead of students learning merely what the law said, and what was on the statute books, more should be taught on the function of the law in solving societal problems, and on the decision-making role of lawyers.

It was not just a question of providing one or two courses on legal policy, Professor McAuslan said. What was needed was an entirely new approach to legal education, and more integrated inter-professional courses, which would include the legal issues as one of a number of elements of a subject.

To help the potential lawyer in public service, he called for more joint appointments, where people holding public legal office would be lecturers at the same time. There should also be more willingness by both law schools and the public legal service to allow reciprocal secondments and leaves of absence.

Professor McAuslan urged the setting up of a school to teach legislative drafting. "No single development is more important and more overdue", he said.

Delegates at the conference were in broad agreement with Professor McAuslan's general views, but questioned whether the conditions about the content of law courses imposed by the solicitors' and barristers' professional bodies were as restrictive as had been claimed.

It was pointed out that in an undergraduate law degree syllabus of some 15 or even 18 courses there were only six "core" subjects on which the professions insisted.

Mr Gordon Borrie, Director General of Fair Trading, previously Dean of Birmingham University's law faculty, argued that even within those "core" subjects a great deal of flexibility was possible, and that many law schools were teaching them in a way which incorporated policy elements.

Mrs Williams asks CVCP for ideas on saving money

The Government is not committed to raising tuition fees for 1978-79, Mrs Williams, Secretary of State for Education and Science, has told vice-chancellors.

But it is committed to making some savings from further and higher education, and those generated by the 1977-78 levels are unlikely to be sufficient.

In a letter last week to Sir John Habakkuk, chairman of the Committee of Vice-Chancellors and Principals, Mrs Williams asked for suggestions on alternative ways of making the savings.

"The size of the gap, and the way in which it will be filled, are unsettled questions. Your advice that I should not look to fees is plain and I have noted it", she said.

"But I should also welcome the opportunity of discussing the whole issue with you and your colleagues and to have your views on where else I should look for the savings that have to be found. They will, I am afraid, have to come from higher education and advanced further education."

She emphasized that it was not possible to revise the new fee levels for 1977-78 because both the Rate Support Grant and the universities' recurrent grant for that year assumed that the new levels would apply.

Your decisions therefore to concentrate on measures selectively and particularly in individual cases [illegible] I am sure, the right response and the one which I have already asked the University Grants Committee to recommend to the universities."

She was referring to a recent statement by the CVCP on tuition fees, in which the committee said it would concentrate on the alleviation of hardship and on securing a satisfactory fee arrangement for 1978-79.

Sir John had warned about the effect in universities if fees were substantially increased. The Government had seemed to indicate there would be further increases in that year, he said.

"This would be deplorable. There should be no misunderstanding about the strength of feeling against high fees, and the committee wishes to leave no one in doubt that if the fees for 1978-79 were to represent a substantial increase in the present level there would be massive discontent in the universities."

The CVCP was totally opposed to high fees, the statement said. It stood by its case made in June last year that university fee income should not exceed 10 per cent of the total.

"We have on several subsequent occasions made strong representations to the secretary of state. To the great regret of the committee our views have not prevailed. We think the Government has made a great mistake."

The figure mentioned by Mr Fowler, then Minister of State overseeing higher education, as the sum to be raised by fees in 1978/79 was £14m on top of the £28m raised by the new levels in 1977/78.

Mrs. Williams has agreed to meet the National Union of Students in a month's time to discuss fee levels for 1978-79.

Mr Pete Ashby, deputy president of the NUS, said: "And after the union's meeting with Mrs Williams this week it was hopeful that there would not be substantial fee increases next year."

He said that the union also hoped, because of the more favourable recruitment grant expected for the universities, the £14m hardship fund originally suggested for both universities and the polytechnic and college sector might now go entirely to the latter, with a sum for hardship in universities contained in their grant.

Leicester warn of 50% drop-out

Half the self-financing students at Leicester Polytechnic have said they will be unable to continue with their courses in October because of the high fees levied, according to a survey by the Leicester area committee of the NUS.

At Loughborough University, where there are 470 self-financing students not in their final year, 42 per cent of a sample of 100 will be unable to continue.

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Industry has place for arts graduates' 'brain power'

by Frances Gibb

Arts graduates from Hull University last year did not realize that they could make a contribution to industry, the annual report of the Careers and Appointments Service says.

Only four out of the 268 arts graduates entered manufacturing. The report says: "Arts graduates simply fail to appreciate that their intelligence, analytical ability and powers of communication are just as important, perhaps more so, as a deep knowledge of a particular 'relevant' degree subject".

Based on the crude measure of A levels, the arts students had the highest level of "brain power" of any group of Hull students. British industry's problems would be overcome only by using the best brains. "Certainly a career in industry is not appropriate for every graduate, but we are disappointed that so few of our most able graduates give so little thought to the possibilities," the report says.

Despite the cuts in teacher training places, 34 per cent of all arts graduates went into teacher training. Many see teaching as the only field of work they can consider seriously, and the percentage entering teaching was 2 per cent higher than the previous year.

Although there was still a shortage of teachers of arts subjects, notably English and languages, there could be no doubt that some of those completing training in 1977 would be unable to get jobs.

Generally, fewer graduates—5 per cent compared with 6 per cent the year before—were unemployed at the end of the year.

Among scientists, the mathematicians, chemists, physicists and electronic engineers had relatively few problems in finding jobs. A smaller proportion of graduates in these subjects, 19 per cent compared with 22 per cent the previous year, entered postgraduate training courses. Finding jobs was less easy for biologists and geologists.

Many economists had to make compromises, the report says, although most eventually found jobs. Posts in economics research were virtually unobtainable, but many were attracted into banking or accountancy.

One group of graduates who had particular difficulty in getting jobs was law graduates. The report warns: "Further expansion of vocation courses in law could be a recipe for disaster unless the vast majority of LIB students can be persuaded to look for careers outside law, and there is little evidence that they wish to do so."

The report highlights the difficulties of certain groups of students —the handicapped, coloured immigrants, and mature graduates—in finding jobs. It attacks rigid recruitment policies that exclude older graduates, and urges companies to examine ways in which mature students could be assimilated.

The Civil Service, it suggests, might take a lead by dropping its upper age limit of 28 for applicants for executive officer posts".

Joint approach on safety is accepted by CVCP

The Committee of Vice Chancellors and Principals has agreed to set up a joint consultative committee on safety which will include representatives of the Association of University Teachers and other unions concerned with university safety.

It will advise on matters connected with safety, and report to the CVCP.

The AUT and the National Union of Students have been invited to name representatives, and the trade union side of the Universities' Committee for Non-Teaching Staffs is to supply 10 nominees from all other unions involved. The AUT representatives will be Dr Cecil Wells, of Birmingham University, and Mr John Akker, deputy general secretary.

The committee's first task will be to look at regulations on the question of safety representatives and safety committees coming into effect in October, 1978. In particular it will examine the note of guidance produced by the CVCP's own working group on safety under Dr John Horlock, vice chancellor of Salford University.

Mr Akker said the AUT had been pressing for representation on the vice chancellor's safety committee for a year. "I regard this as a success. There is a very great need for some central coordination of training and advice on things which are of mutual concern to the trade unions and the universities."

Until now, the CVCP has resisted a joint central committee on the grounds that it would impinge on the autonomy of individual universities, he said.

The CVCP working group is currently planning a series of specialized handbooks on such topics as fire precautions, lasers, university workshops and laboratories as part of its code on the general principles of safety in universities.

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The sixteenth-century Persian miniature, above, showing Indian war elephants being routed by cavalry during a battle between Alexander the Great and Porus, is one of the 10,000 Persian minatures owned by the British Library. They form the basis of a new exhibition in the library's galleries at the British Museum, open until July 31, weekdays 10 to 5, Sundays 2.30 to 6.

An exhibition of books in Manchu, the language of the nomadic tribes who destroyed the Ming dynasty of China in 1644 and inaugurated the Ch'ing dynasty (1644-1911), is also on show at the museum, until June 30.

Falling population 'could put polytechnics at risk'

The polytechnics will be in jeopardy in an era of falling population unless they make a greater effort to establish themselves as different from the universities, a senior local authority educationist warned at the weekend.

Mrs Margaret Rees, chairman of the Inner London Education Authority's further and higher education subcommittee, said that unless the polytechnics could find new kinds of student and convince the Government they were doing something unique, they were going to be at considerable risk when the 18 plus population started falling in the 1980s.

"Unless higher education institutions attract a higher proportion of the 18-plus age group there will be large numbers of spare places — especially in the polytechnics which, with one or two honourable exceptions, have become a pale model of the universities."

She added that some polytechnics were getting rid of sub-degree work as fast as they could and so excluding the groups of potential students who would fill places in the 1980s. She paid tribute to those polytechnics which had made a special effort to attract students without formal qualifications, especially the Polytechnic of Central London whose director, Dr Colin Adamson, has recently been bitterly critical of the ILEA and local authority control of polytechnics.

Speaking at a meeting of the London Students' Organization, Mrs Rees produced figures showing that while the number of 18 year olds in London would rise slightly between 1977 and 1981, they would fall by 40 per cent by 1990. At the same time population movements out of London would leave a city at a disadvantage in the inner city. Public sector further and higher education had a responsibility to this group, she said.

Questioned by students, Mrs Rees defended ILEA policy on imposing a quota for overseas students at London colleges, arguing that resources had to be redistributed to those in need in areas such as Brixton.

Ulster college intake cut

by Paul McGill

Speculation about the future of teacher education colleges in Northern Ireland increased last week after the disclosure that the Minister of State for Northern Ireland, Lord Melchett, intends to cut their intake to 700 next September.

The news was given to the Advisory Committee on the Supply and Training of Teachers, which had recommended an intake figure of 1,000. The figure of 700, which does not include entrants to Derry Technical College, or to colleges in Britain, compares with 1,373 last year and more than 1,900 in 1974.

Lord Melchett told a meeting of the advisory committee that priority had been given to the creation of employment over the past two years and that intake to the colleges must now be matched with wastage from the profession.

He admitted that there was uncertainty about wastage rates, but he refused to give details until after his public announcement of the new intake levels.

However, a paper prepared by the Department gave the current wastage rate as 3 per cent net, consisting of 5 per cent wastage less 2 per cent re-employment. In the five most recent years, for which published statistics are available, wastage rates ranged from 6.4 per cent to 7.9 per cent.

Tory 'task force' move

The Conservative Party is about to set up a working group of top academics, trade unionists, and businessmen to study the relationship of engineering education and industry.

The group, which will be chaired by Professor John Thornton, professor of chemical engineering at Newcastle University, is the first of the "task forces" that are to be established as a result of the Tories' recent initiative to create links between Conservative policy makers and those engaged in research.

Dr Keith Simpson, MP for Ripon, was recently appointed as party liaison officer, with the job of establishing universities and polytechnics to find suitable academics.

The terms of reference and full membership of the engineering working group have yet to be announced, but the academics are: Dr John Horlock, vice-chancellor of Salford University; Professor Norman Dudley, professor of engineering production at Birmingham University; Professor Boris Cole, professor of mechanical engineering at Leeds University; Dr George Brosan, director of North East London Polytechnic; Professor N. B. Graham, professor of chemical technology at Strathclyde University; Professor G. Marsh, professor of engineering at Durham University; Professor Douglas Holder, professor of engineering science at Oxford University; and Professor A. W. Bright, professor of electrostatics at Southampton University.

Experts who know more about less

by Sue Reid

Professor Arnold Kettle, professor of literature at the Open University, has strongly criticized overspecialization in higher education, undesirable and self-defeating.

At the annual conference of the Association of Colleges implementing the Diploma in Higher Education in Birmingham last week, he argued for the development of interdisciplinary courses which were more objective and closer to reality.

He told the conference: "The degree of specialization which has become characteristic of the British education system is undesirable and self-defeating. Each subject becomes more of a mystery to its practitioners who see themselves as specialists knowing more and more about less and less."

"These practitioners turn every subject into something deliberately mystifying to those who do not share its secrets and I see serious and deep dangers in this".

Professor Kettle warned that it was becoming difficult to see how teaching or research fully in a context because of over-specialization. Particular subjects were not dealt with in relation to the changing situation in the world.

The exclusiveness of many degree subject disciplines was imperiling. A concentration on single subject education, although it had its positive attractions, was disastrous because it failed to provide a truly balanced education and turned disciplines into something self-perpetuating and self-defeating.

Most higher education students were now subjected to a system geared to the production of degrees and universities created their courses around the training of academics. But, Professor Kettle said, this system was suitable only to the 10 per cent or 15 per cent of students gaining first class honours. The majority of students had the next specialist education but because they failed to achieve first class honours degree were treated as specialists in their subject.

Mr Jim Porter, principal of Bristol College of Higher Education and chairman of the Council for National Academic Awards' Diploma group, told delegates that the DipHE was likely to survive in spite of the "battering" it had received.

He said that 20 institutions would be offering CNAA validated DipHEs by September, the majority of these polytechnics. Challenging the view that the DipHE had been introduced to counter the declining role of the colleges of education, Mr Porter pointed out that only the graduate training institutions would be losing the diploma.

Six of the DipHE programmes on offer in September would be inter-disciplinary, five modular, and one centred on independent study. Others would cover specific subject areas including engineering, science, computing, art, economics, music, social sciences and mathematics.

Britain was still very tied to the concept of three-year degree course but there was a good case in some subject areas, notably engineering, for the development of "two plus two" courses leading from a diploma into a degree programme, Mr Tony Sandbach, assistant director of Wolverhampton Polytechnic, told the conference. These four-year programmes could be general at the diploma stage and become specialized in the second two-year stage leading to the degree award.

He said that colleges offering DipHEs should start exploring the possibilities for their students to transfer to degree courses very early. Most successful transfers had involved the movement from modular DipHEs to modular degree courses, and it had been possible that flexibility in the final year of the diploma was necessary for transfer to take place.

Two for committee

Dr William Taylor, director of London University Institute of Education, and Mr D. E. Mumford, principal of Cambridge College of Art and Technology, will represent higher and further education on a committee set up by the Government last week to examine the role of a common examination for 16 year olds. The chairman of the review body is Sir James Waddell, a former civil servant.

On the other hand

One over the eight

As a champion of the underdog, I now offer a unique account of the boat race in which no mention is made of either the Oxford or Cambridge crew. I shall instead concentrate on the reserve teams, Isis and Goldie, who, it seems to me, get a pretty raw deal.

Not for them television documentaries, nor press funfares, nor luxury accommodation, nor free weekends in the Isle of Wight, nor swooning women. No, they have to find their own accommodation, eat as best they can, and then, on the day, row up the Thames while everyone asks who they are.

No one's mother flies over from America to watch them and no interest flickers in any commentator's voice. They are also rowed in, with the possible exception of Charon's boat ride to Hades, there is no more certain aquatic route to oblivion.

However, this year it was different. On a bunk of complete indifference I roared and whooped and cheered. When my team came into view, I threw my scarf into the air; when they crossed the line, I hugged people. It was an utterly thrilling race in which Isis took a two length lead, only to be overhauled and lose by seven.

Afterwards I surged forward to congratulate them and say that I too had once rowed, because at least it was a sport one could do sitting down.

Mr Paul Wright, a member of last year's triumphant Isis crew, who has now been promoted to some other Oxford eight, said: "It is true they do have a tough time of it. I am sure they will appreciate your support."

Afterwards there was another race involving crews from the same universities. I looked the other way pointedly and whistled.

All Greek to me

There are more ancient Greek speakers in central London than you would imagine. Last week, audiences packed into King's College to see the classical society's production of *The Clouds* by Aristophanes, performed in the original.

Although I had Greek at 16, something fairly serious has happened to it since. But I went along to see if the others fared any better. Of course, if you did not know Greek then what you would be watching was a drama about an old man in a smock driven mad by seven eccentric women who all talk at once. As if this were not bad enough, whenever his best friend (a nice old man in a hat) drops in for a quiet chat, the girls start singing and dancing and pointing at him —which would put a strain on any friendship.

To my amazement the audience roared with laughter. Admittedly, many of them were school parties, led by classics masters who got all the jokes and just about wept at all the fun.

I showed more respect in the face of a classic than to laugh. But could not resist it when a schoolboy was hauled up on to the stage clutching copies of the original and the translation which he scanned in vain for a stage direction to account for his predicament.

However, back at the plot, the seven eccentric women were still dancing a lot and making life pretty intolerable for the nice old man in a bar who had by now got some of his friends in to sort out these dames. The denouement was quite unexpected: one of the girls suddenly hung a large drawing of a chicken on the wall at which one of the nice old man's friends set fire to the building, a view with which we must have sympathy.

As I looked round the audience, I noticed that most of them were reading a book. Well, I did not think the show was as bad as all that.

Dr Magnus Pyke is to retire as secretary of the British Association for the Advancement of Science. It is the extrovert scientist has been unusually quiet on this and other topics recently, it is because he is currently on the high seas with Lauren Bacall, Mel Tormé, Joe Loss and Lady Isobel Barnett whose talents have been hired by Cunard to entertain passengers on an 81-day world cruise.

Forget it

Romance is dead—official. Time was when young men, crossed in love, went on expeditions to forget and came back purged with armfuls of plant bugs and nomadic pumans; but not any more.

In July the Royal Geographical Society expedition to Mulu (Sarawak) sets off for 15 months and the society's president, Sir Duncan Cumming, takes a strictly scientific line. "The accumulated experience of a century and a half ensures that expeditions have a practical purpose and that they are able to concentrate on the scientific ends for which they are planned."

Forty-two scientists are to spend months at a time there to produce a survey of the Gunong Mulu rain forest which is endangered by erosion.

At the launching session the team members also took a practical line. As they sat in the oaken hall of the Royal Geographical Society with the names of great Victorian explorers inscribed around the wall, they outlined the ecology of the district and the importance of protecting rain forests.

The only dash of old-style romance was the expedition leader, Robin Hanbury-Tenison, an explorer who looks like Captain Mark Phillips and sounds like David Attenborough. He showed us slides and talked about "base camp" and "having to cope with moments of drama".

His eyes lit up when amid all the scientific talk, a colonial gentleman got up and asked him to give his regards to a very old friend in the Gunong Mulu National Park district. Probably someone he met while over there forgetting.

Flash of genius

Ever since I invented a device for making church bells ring silently in the early hours of the morning, I have been fascinated by the whole process of invention. Its precise nature becomes clearer this week with the publication of *How To Invent*, by M. W. Taring and E. R. Laithwaite (Macmillan, £7.95).

The authors, who are professors of mechanical and electrical engineering respectively at London University, say that 50 per cent of normally intelligent people could be inventors if only they freed their minds from received educational shackles and exercised self-discipline.

Their analysis of the "inventive flash" is remarkably accurate in my own case. First, the "emotional brain" sees a human problem and desires to solve it (church bells are a public menace and a major cause of emigration among people of sensitivity). Secondly, the "physical brain" observes reality (there are an awful lot of bats lying around belfries for no immediately apparent purpose). Thirdly, the "intellectual brain" applies scientific laws (train a select band of selfless bats to sleep clustered round the bell's clapper such that, come eucharist, they would cushion its blow and aid those who believe that worship is not possible without eight hours' sleep).

To coincide with the book and the British Genius Exhibition planned for Battersea Park next May, Macmillans are cosponsoring a competition for would-be inventors. Those thinking of entering will find helpful training aids in the book and a list of items in need of invention. They are told that persistence is the most important quality in ironing out design faults. (What do you do afterwards with a community of seriously concussed bats?)

Bookmaker (5)

My tips on how to write a university novel are almost complete. The only major character left is the absent-minded academic who in my novel will be called Jack Muybee and who holds the Brillo Pads professorship of mixed ability Egyptian.

To establish his absentmindedness you can have a breakfast conversation with his wife like the following:

"Where are your gloves, Jack?"

"In the bank."

Stunned, she rises to telephone her best friend, Margot.

"Jack has invested his gloves with the Midland Bank. . . . Yes, we're all surprised, Margot. . . . No, they're not valuable. They are woolly, with three fingers missing and daisies sewn across the knuckles."

In this way you can gradually have him distractedly invest his entire wardrobe and a neighbour's watering can until his absentmindedness has been impressed upon the reader. You can then go on to the main action.

Recently there were a spate of cases in Oxford where kind-hearted dons were "conned" out of large sums of money by confidence tricksters, working in gangs, who claimed they had once met on holiday and had now fallen on hard times. Jack is a natural for this.

One night he answers the doorbell to find Don Connors and his 38 brothers crushed into the porch.

"Hello", says Don, "Remember us? Isle of Wight ferry 1932?" A half smile of uncertain recognition plays across the kindly Egyptologist's face.

"If I were to say 'Shanklin sea scouts where your wife swallowed two small rubber washers', would that help?".

Faced with this wealth of circumstantial detail, Jack turns and shouts in to his wife. "Look who's here, darling, it's the boys".

"Who are they?" she barked.

"Never heard of them".

"You must excuse my wife, she once worked in industry." He grows confidential. "She worked for a firm that made lemon sponge puddings and it has affected her priorities."

Eventually they con him out of four Persian carpets and a package holiday in Tierra del Fuego. To give an exotic touch to your work (and get some foreign travel while they are filming it) you are advised to include a scene where the brothers are arrested dancing the conga in Bio Bio shopping precinct.



A concussed selfless bat.

Problem of post-school age group



Bryan Davies

Parliament, unlike nature, finds a vacuum eminently tolerable. The gaping hole left in the Government's legislative programme by the suspension of the devolution debate provides MPs with earlier nights and perhaps greater opportunity for reflection.

For those like myself who entered the House after the first election of 1974, this month marks the conclusion of three years work since we emerged from the euphoria of electoral victory into the harsh reality of political responsibility during economic crisis. Perhaps the Government will also seize the opportunity to take stock of the situation in which it enters upon the second half of its parliamentary term as a minority administration. Against this sombre background it may prove useful to examine the Government's record in that area of education to which it has allocated priority, namely to post-school groups outside full-time higher education.

Not being of the school that believes that this particular Government should hide its light under a bushel, I begin by testifying to the advances which have been made. The quality of many educational system depends crucially on the state and ability of the teachers. The Houghton award brought a highly significant improvement in the salaries of further education teachers.

The greatest single new stimulus to the work of the colleges has clearly been the developing role of the Training Services Agency. For many colleges the result has been the growth of student numbers on courses which present particular problems for the staff concerned. Nevertheless, the tensions which have emerged between the training function represented in the TSA and the broader educational objectives of further education colleges do not detract from the impressive achievement of this programme.

Colleges have also increased student numbers with the tendency of A level students to prefer their environment to the school sixth form. In many respects this voluntary movement by a cohort of students fits in well with the Government's expressed intention of establishing a closer liability between the world of education and the world of work. Certainly even more students committed to the more standard A level courses are in institutions whose teaching staff frequently have wider career experience than their counterparts in the school.

Moreover, the student body itself reflects a heterogeneity which broadens perspectives with its mix of part-time and full-time, young and mature students. Although the question of courses and credentials to satisfy the diverse requirements of this age group presents a bewildering array of problems, the establishment of the Technician Education Council and the Business Education Council give some hopes of greater rationalization.

In adult education, however, the Government's banner looks considerably more threadbare. Repeated parliamentary challenges on its failure to make progress on implementing the Russell report tend to produce the single riposte of the success of the adult literacy programme. As one of those involved in the campaign from its early par-

liamentary origins, I scarcely seek to undervalue its achievement. Indeed it represents a most praiseworthy example of intelligent ministerial pump priming to enable local initiative to flourish in a critical area of social disadvantage. The resources committed by central government have been exiguous but enthusiastic voluntary commitment, and the power of television broadcasts have contributed mightily to a highly encouraging venture.

This record, however, scarcely represents a coherent policy for responding to priority needs of the 16 to 19 age group, nor an impressive advance along the road to education permante. Counterbalancing the undoubted successes can be set a melancholy list of procrastination, neglect and in several crucial respects of contradiction of established priorities.

The expansion of awards in recent years may be thrown into sharp reverse, with severe consequences for many sub-degree courses. One illustration may suffice. The Government has made much of its determination to extend courses in trade union studies in the wake of recent legislation which greatly increases the responsibilities thrust upon shop stewards. One such course, however, will established and enjoying a high reputation in the educational world and with the TUC is revealing problems with recruitment directly attributable to the difficulties confronting intending students applying for discretionary awards.

This experience is scarcely atypical. Thus the very courses upon which recent Ministerial statements have placed great emphasis are the ones which are likely to suffer most acutely from the cuts. It is pointless of the Department to be preaching the virtues of many sub-degree courses for their high vocational relevance and high practical content if the system of student support discriminates against them.

Nowhere, however, is there a greater danger of missed opportunity in British education at present than in the reorganization of the colleges of education. This government is destined to carry the incubus of the sharp reduction in teacher training places. It should not risk the added charge that it neglected the opportunity of a fresh and constructive role for the colleges which remain.

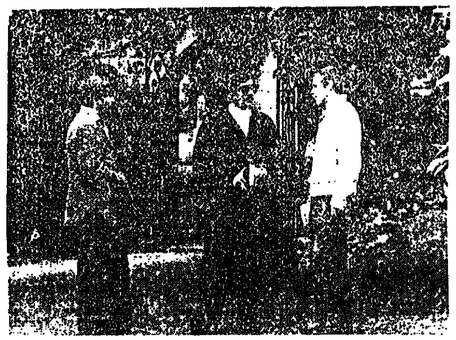
Present policy has been one of crude reallocation of resources operating against criteria which have been far from clear or consistent. Some colleges, having merged with polytechnics, are probably locked into increasing emphasis upon degree level work. Others have been linked together to maintain predominantly their traditional role in teacher education.

Far too many of the new institutions, however, appear to be bidders in the increasingly competitive market of degree-level students. The Department and the local authorities could have defined a role for their future in very different terms. They should have been encouraged to develop their links with further education colleges and to develop sub-degree-level work. This would have brought added breadth of opportunity to a student category which will clearly expand over the next decade.

It is, of course, by no means too late for such a restructuring to take place. Nevertheless, such a radical change in roles can probably be achieved only under a period of intense pressure. The danger is that the colleges which have survived the ultimate threat of closure will persist in sustaining existing values and educational programmes orientated to the more academic students. Thus a Government committed to increasing the opportunities for 16 to 19-year-olds will have allowed a scarce resource to develop the wrong emphasis. The opportunity to establish the basis of a fresh concept of the community college, wider than the further education sector, but developing its strength in relationship to part-time study and skill development may have been sadly neglected.

Economic recovery will not remove the structural problem of unemployment which presents a great and daunting challenge in the years ahead. The post-school-age group will rightly demand an increased share of the nation's resources. For them, and for adults subjected increasingly to technological unemployment the provision of part-time education and the opportunities for skill development is the crucial demand upon the educational system. In this respect this Government has merely made a start.

The author is Labour MP for Enfield, North.



Tutorials, the cloistered calm of colleges, students on bicycles amid splendid architecture, are all part of Oxford University's 700 year tradition. But how has it coped with modern needs, and how well does it work as an educational establishment? PETER WILBY wrote this four-page report.

Colleges keep tempo of chang at slow, slow, oh, so slow

"The place engulfs you—it wraps itself around you rhetorically and architecturally. It resists change, but it also disguises change as continuity." That is how A. H. Halsey, Fellow of Nuffield College, describes the University of Oxford.

The most striking surface characteristics of Oxford are conservatism and self-confidence.

At times, the self-confidence becomes suffocating complacency. Oxford dons are not given to critical questioning of the underlying principles of higher education. If you ask about the value of Oxford's history, PPE or Greats courses, you are told that there can be nothing much wrong with them because industry, the professions and, above all, the civil service continue to recruit the graduates.

It does not occur to anyone to inquire whether the post-War performance of any, the British civil service is wholly satisfactory, and whether Oxford might not be able to provide it with more relevant skills.

Change is undeniably slow in Oxford. The existence of 35 separate colleges, inward-looking feudal villages, many of them dating back to the Middle Ages, not only obstruct change but also inhibits thought and talk about change. In 1966, the Franks Commission proposed a Council of Colleges that could speak for them with a single voice. Instead, there is merely a Conference of Colleges that never presents anything remotely like a common view.

The college system retains its vitality because it can still obstruct and irritate and frustrate. To understand that is to understand why no new university in the world has been successful in copying it.

The bedrock of the colleges' power is their continuing control over undergraduate teaching and admissions. Almost all still try to cover almost all subjects. Proposals to concentrate the smaller subjects in a few have been only partially successful. In 1975-6 botany had 11 undergraduates in Pembroke and 10 in St Catherine's but another 17 were spread across 10 colleges. Agriculture had 15 of its 60 undergraduates in Keble but the rest were in 16 different colleges. Metallurgy, with 60 undergraduates in 11 colleges (45 in four of them) perhaps came nearest to concentration. And the larger the subject, the smaller the proportion concentrated in any one college. Out of the 1918 historians in college had more than 50 or less than 20.

It is not so much the colleges' system itself as that system allied to financial cushioning that makes Oxford idealistic. When teaching is based on lectures it is a relatively simple matter to have compulsory one paper that was previously optional and another optional that was previously compulsory: one day will find fewer people in his lectures than before, the other will find more. But there is no similar flexibility in a tutorial system based on groups of one or two. If there is to be change, all the dons must be involved in implementing it.

David Caute, the former Fellow of All Souls, has observed that, when changes in syllabuses are proposed, tutors groan, because it is they who will have to bear the burden of "mugging up" new subjects and disciplines and widening their range. All universities progress by consensus, but in Oxford the consensus has to be wider. Even a minority of 10 per cent can make a nuisance of itself.

The result is that many Oxford courses, particularly in the arts, appear archaic. Roman Law is still compulsory in the first two terms of the jurisprudence degree. Two out of six papers in English Literature prelims are on Anglo-Saxon. The theology degree structure is almost unchanged since 1923—six out of eight honours papers are on Biblical studies, and Greek is compulsory.

The largest honours school in the university is still modern history. Last year, it had 284 finals candidates out of the total 2,735 compared with 268 out of 1,305 in 1939. Its examination regulations open with the statement: "The examination in the School of Modern History shall always include the History of England." The "History of England" means a continuous survey from Roman times to 1939.

Even though the regulations mention economic and social history, the major focus is on political, constitutional and diplomatic history. There is no mention of scientific history and, among the 25 special subjects, there is only one option on the history of science, and that concerns the seventeenth century.

A general history paper on imperialism and nationalism and a special paper on civil disobedience and constitutional experiment in India between the Wars represent the only ways in which undergraduates could possibly encounter the Third World.

To be fair, there have been some changes in modern history. The paper on political thought is being extended to encompass economic and social thought. The number of questions in finals papers have been reduced from four to two.

But these are regarded as major reforms. The general attitude is "don't, push us too far too fast". In its essentials, the modern history syllabus remains unchanged since 1870. Ask a functional question in Oxford and you get an ontological answer. "What is modern history for?" "Modern history is a training of the critical faculties." It is not explained why this particular syllabus is thought to be especially appropriate for training critical faculties.

The last formal line of defence against change is Congregation. This body, which has to approve all major changes, comprises the entire academic staff of the university and is, within limits, Oxford's supreme governing body.

To admire Congregation as a manifestation of pristine democracy is, however, to misunderstand the nature of the animal. It is undemocratic only from the point of view that being in Oxford-don is all that may be required of a man or woman. It does not make distinctions between academics; less than one-third of the dons in Congregation are professors, and there is no distinction between members of the aristocracy. There is no role for students nor for the lower grades of administrative staff.

In any case, its effects are not democratic by any standards. Proposals to reform the engineering science syllabus won't get two-thirds majority in the faculty but were defeated when it came to a postal vote of Congregation members because the most influential engineers were against it and were better able to marshal support among college fellows who had only the dimmest notion of the issues at stake.



One generous description of Oxford's system of government is that it is "a total democracy with oligarchical aspects". Log-rolling is a major Oxford industry.

Yet, if Oxford is cautious about change, it may claim to implement change more effectively, once it is accepted. New courses are not set up only to wither away, as in the new universities. Nine joint honours schools have been set up in the past seven years. To repeat Halsey's observation, change is disguised as continuity.

Most outsiders would probably think that politics, philosophy and economics had been around for generations, so firmly does it seem absorbed into the Oxford structure and style. Yet it is scarcely more than 50 years old, and was originally introduced as a controversial, revolutionary counterpoint to Greats. Something similar is already happening to human sciences, which took six years of struggle to establish.

Again, Oxford has been slow to expand and absorb technology even in the wake of the Franks Committee's strictures on the subject. Yet, almost imperceptibly, it has become a more science-based university. The proportion of student scientists, 19 per cent before the war, is now 35 per cent. The chemistry school is the fourth largest in the university. (Before the Second World War, Cavendish, tenth in size, occupied that position.) Engineering and metallurgy are no longer poor relations. The last new science building completed in Oxford was for these two subjects. Current plans are to increase the two schools' numbers by about one-third.

This is not to deny that Oxford's science is probably purer and more academic than that of any other university in the country. Its engineering science degree is of the extreme theoretical variety (laboratory rather than workshop-based) that academics in technological universities and polytechnics are always criticising. It is possible to take a first-class degree in engineering at Oxford without ever learning anything of welding.

One of the arguments deployed against the engineering science reforms (which would have put a somewhat stronger emphasis on creative design) was that they would isolate engineering science from physical science. It is a fear Oxford belief that academic subjects must remain more closely attached to their intellectual roots than to their external applications.

Last year's report by the Commons select committee on science and technology about university-industry relations revealed that only 2.2 per cent of the value of total research contracts with Oxford's science departments derive from industry and that "it would hardly be surprising if 98 per cent of the research carried out in these departments was of little relevance to industry". But Oxford, in its own stealthy way and at a pace appropriate to a 700-year-old university, is setting about putting these things right.

"There is a university-industry committee, which finds people who can meet requests from industry for specialist advice. Characteristically, Oxford, unlike some other universities, has not set up a formal bureau but an essentially informal network which, though it started with a full-time secretary recruited from ICI, now relies upon the part-time services of a Registry officer.

There is a university centre for management studies, whose activities have expanded steadily over the past 10 years. It is currently planning to set up a teaching company for engineering science students. The centre's visiting staff includes Bill Weinstein, a Balliol politics tutor. Some four years ago, Weinstein and a few other dons started a series of extra-curricular seminars at which dons and undergraduates could meet people from the business world.

"The idea", says Weinstein, "was not to sell industry but to put over the realities. We got people to talk about actual cases of decision-making. That at least stimulates intellectual curiosity." The meetings were not formally advertised: the word was put round on the tutors' grapevine. "We were implanting something in the total environment that might have a modest effect over a long period of time", said Weinstein.

Implantation . . . a modest effect . . . long period of time. These are characteristics of both change and conservation in Oxford. It is rarely possible to identify, with any certainty, the source of either. Appointments, for example, are normally [illegible] university college responsibilities (generally, the university pays about one-third of an arts don's salary and about two thirds of the scientist's salary) and naturally they have conflicting interests.

The faculty board leans to the candidate with the best academic reputation in the subject; the college (while obviously concerned with academic reputation) may be more concerned with a candidate's quality as a teacher and his or her willingness to take on college administrative responsibilities. The faculty may feel that the university as a whole is short of late medievalists, while one college already has a fellow who covers that area.

It is a delicate mechanism, in which each side can theoretically go ahead on its own but, in practice, will not do so because neither can afford to finance the appointment entirely from its own resources.

It is possible to speculate that the increasing influence of the faculties and sub-faculties, seeing appointments from the perspective of academic "professionals", accounts for the declining incestuousness of Oxford appointments.

At Worcester, for example, all but one of the 13 surviving fellows who were elected before 1961 are Oxford graduates. Of the 21 elected subsequently, 15 took their first degrees elsewhere, including one at Hull. And recent appointments to university chairs and readerships have been particularly notable for importing outside talent.

But equally, it is possible to speculate that even the college backwoodsmen (and, of course, it must never be remembered that nearly everyone in Oxford is formally a member of both a faculty and a college) now accept the equality or, at least, the comparability of other universities in a way they did not 20 years ago.

Above all, the university's central activity—undergraduate teaching—is essentially unorganized. Only the tutorial and the essay are compulsory. The syllabus, the course and the focus are the responsibility of individual tutors. Lectures, laid on for the students, are rarely coordinated with each other and never at all coordinated with tutorials.

The tutorial, indeed, is Oxford's *sine qua non*, its crowning glory: its gift to the world a few younger dons express doubts about it, arguing that one hour or two are ineffective for transmitting information appropriate for developing discussion skills.

Andrew Glyn, economics don at Corpus Christi, said: "Some tutorials on the same subject can be deadening. You research for an awful lot of the time in addition in an unconstructive way. You can't concentrate on one thing that interest you and then tutor the student. You have to cover everything."

Dons like Glyn argue, as the Franks Commission, that the excessive use of classes and lectures to lift the load of "coverage" sometimes threatens to stifle the tutorial system. In fact, classes have become increasingly common in Oxford.

Clark Brundin, senior tutor in Jesus, an engineer and ancient history lecturer, argues that the two disciplines benefit in different ways.

"The very able student gets stimulation, the marginal student gets the extra help", he says. "For the average student, it's important academically but worthwhile from the personal point of view. He can get used to write a reference for him."

The reference is, perhaps, important than it might be. Oxford's examination system sets the standards of most course in the universities, is wholly unsympathetic to the "continuous assessment" fashionable in many other universities. Kenny, senior tutor at Balliol, argues that the tutorial system, by the tutor developing a detailed knowledge of his student's progress, is itself a form of continuous assessment, providing an informed judgment to the formal examiners.

The Oxford tutor's method, which will be more doubtful and convincing than a reference based on a few hours' discussion in another university, is of the least importance to a student's career prospects as the degree.

But Oxford pays a heavy price for its excellence and autonomy. They are, for one thing, extremely intensive. The College tutor is expected to teach a minimum of 12 hours a week, and some of them as many as 20. That is thought to be exhausting (though it would probably be laughable to a school teacher grappling with classes of 35 or more 14-year-olds) even though there is only a 24-week academic year.

More important, perhaps, the spread of teaching through the colleges means the end of any sense of the same species. Oxford has one of the largest philosophy departments in the world, yet it has gaps in its coverage. There is, for example, no Hellenistic philosophers, no medieval philosophers, no post-Kantian Continental philosophers.

The college system also militates against the realization of Oxford's ambition as a graduate centre. The proportion of graduates is only 15 per cent (compared with 9 per cent before World War Two) but they have had enormous influence in creating a departmental and research spirit, though the college system itself has been adapted to meet the specialist graduate's need for provision for graduate accommodation. It is still inadequate, however, and the growth of graduate numbers (still incomplete) has undoubtedly have either the facilities or the atmosphere of a department.

Then there is the question of resources involved in the dual system. There are colleges with university libraries and laboratories and little overlap between them, for example. Oxford's colleges and university system has much in common with the federal system of government in the United States, but the question is how long the system can continue to afford it.

The great 'handicap race' in the entrance stakes

A decade ago, the Franks Commission on Oxford University reported that "the admission procedures of Oxford are not in all respects satisfactory." They did not, said the commission, "completely meet the two great requirements laid on all universities of academic efficiency and social justice." Despite its conscious efforts, Oxford was "vulnerable to the suspicion of privilege and social injustice".

The three tables below show that Oxford has genuinely tried to meet these criticisms. But the relative lack of success in admitting a higher proportion of maintained school pupils raises the question of whether it has tried hard enough. Among men, despite dramatic changes in their origins during the 30 years before Franks, there has been very little change since the commission reported.

The chief reform in Oxford entry procedures over the past 10 years has been the expulsion of the pre-A level entry routes. This was supposed to be to the advantage of maintained schools, many of which have no provision for a third year sixth form preparing students for a post-A level entrance examination. First, candidates were permitted to take entrance papers in their second year (or fourth term) of sixth-form studies. Arts and social science candidates take the same papers as the seventh term candidates (though they are marked more leniently), while natural scientists take a special paper.

Secondly, an increasing number of colleges—and this year, for the first time, all colleges—have made "conditional" offers to a proportion of their candidates. These are offers of places, conditional upon the attainment of specified A level grades, made upon the same basis as all other British universities. Such candidates do not take an entrance examination.

Around 45 per cent of all the candidates accepted for next October have taken the pre-A level entry route. About 10 per cent of the total acceptances have received conditional offers. (On the experience of previous years, about one quarter will fail to attain the required grades.)

Most Oxford admissions tutors now describe the Oxford entrance examination — and to a lesser extent, the A level examination — as a "handicap race". In other words, a lower level of attainment is expected from a student who attended an obscure northern comprehensive than from one who went to a famous public school. The justification, say the tutors, is that they are interested in potential not in attainment — exit standards are more important than entry standards. The problem is to determine precisely what the handicap should be.

"I don't like public school men", said one tutor. "They have to be good to get past me." Another admissions tutor said that his college might admit a comprehensive school candidate with 45 per cent in the entrance exam in preference to an independent school candidate with 70 per cent. Others, like Maurice Keen, at Balliol, while subscribing to the idea of the handicap race, have a more cautious approach. "It is neither just nor kind to bring up people who will fail their prelims. The man who is a top boy at school all the time and comes here and finds himself in a competitive situation can be badly thrown. And there is no doubt in my mind that independent schools produce intelligent, educable people. They have proved themselves."

A physics tutor said: "We do try to spot the public school people who are just well drilled. But we've got to take attainment into account or they simply can't start the course."

The results of the inexact science of Oxford admissions can be seen in table 3. The statistics leave little doubt that the really good maintained school man with high A level grades is swapped up almost without a second glance. At the other end of the scale, a maintained school candidate with poor results is more likely to get a place than an equivalent independent school candidate.

There are, however, no differences in the rates of success for students in the large middle category of "good" A level results. And it is among the pre-A level candidates that the independent schools establish the major advantage that gives them, overall, a higher success rate than the state schools. There is an unofficial bar on independent schools (or, rather, schools with three-year sixth-forms) submitting candidates for conditional offers. But, although the acceptance rate for conditional offer candidates is lower than for pre-A level candidates as a whole, this does not explain the discrepancy. Ironically, the pre-A level entry exam—originally a device introduced to benefit state schools—now appears to favour the public schools.

Public schools know requirements

One possible explanation is that, while the state school is compelled to enter all its candidates for the pre-A level scheme, the public school sends only those it considers to be exceptionally able and mature. But it is more likely that the examination itself—whether taken before or after A level—and despite the handicapping—shows the public school candidate in a better light. Since there is no prescribed syllabus, the public schools, with their long-standing personal and institutional links with Oxford, have a clearer idea of what is required.

Why, then, retain the entrance examination? Some tutors would be happy to abolish it. Patrick Sanders, a Balliol physics tutor, said: "The entrance examination is time consuming. You almost spend more time on totting up whether to admit a man than on teaching him in the first year."

The entrance examination fits well with the Oxford system of personal college tutoring. Each college does its own marking of the entrance papers (except in mathematics), and tutors can have the papers in front of them as they talk to candidates.

But the chief obstacle to abolishing the examination is wholly internal: it is a device for ensuring that the high-status colleges do not monopolize the able candidates. The entrance examination is linked to the award of scholarships. These are no longer of much financial importance to undergraduates — none of them are worth more than £60 a year. They are, however, important to the colleges. No college can offer more than a limited number of scholarships. If a student's first preference college is unable to offer him a scholarship, the candidate must then accept an offer from any college lower in his list of preferences that is prepared to offer him one. Only if they all fail to offer scholarships can he go back to his first preference college for an ordinary place.

The system is a delight to college tutors with a gambler's frame of mind, a source of irritation to others. An Oxford don once wrote that the students no more understood their real role in the scholarship system than did the hursus at Ascot.

Abolition of the entrance exam and the scholarship system might make Oxford less daunting to maintained schools. And this would probably have more benefits than any system of more refined handicapping. Oxford's main admissions problem is still that it does not attract sufficient numbers of state school candidates. The maintained school, as Table 2 shows, is still inclined to believe that Oxford will take only candidates with the very highest A level results.

If Oxford could attract more men and women from state schools, even at the cost of lower entry standards, it would have little to fear. (Whether it is desirable that academic talent should be more heavily concentrated in Oxbridge rather than in other universities is another matter.)

Degree results over the past 10 years hardly suggest that the more flexible entry policy has lowered degree standards. Ten years ago, 73.5 per cent of the undergraduates got first or upper seconds. Last summer, it was 85.6 per cent. Ten years ago, the average score on the Norrington Table (which awards three points for a first, two for second and one for a third, then calculates the actual score as a percentage of the maximum possible score) was 59.9. Now, it is 66.1.

Past surveys (the latest was of the 1967 entry) have shown that state school students attain substantially better degree results than public school students. And the recent history of Hertford College has significant implications for the future of Oxford admissions.

Some years ago, the college deliberately decided to widen its entry and look more to the North of England. It pioneered conditional offers in the face of opposition from other colleges, and later, it started making "unconditional" offers, in which pre-A level candidates are guaranteed places provided merely that they obtain two passes. Hertford, bottom of the Norrington Table as recently as 1971, has now soared to sixth place in each of the last two years.

In most colleges, tutors are probably still too reluctant to take risks. To meet the Franks requirements of "academic efficiency and social justice", Oxford could afford more discrimination in favour of the candidate with less impressive exam results.

Where the entrants come from

Table One
Type of school of men undergraduate entrants to Oxford. Percentages.

	1939	1959	1966	1977
Maintained	19	30	40	44
Independent	62	53	41	37
Direct Grant	13	15	17	16
Others	6	2	2	3

Type of school of women undergraduate entrants to Oxford. Percentages.

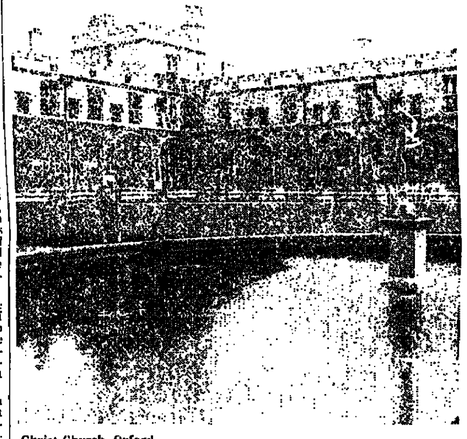
	1939	1959	1966	1977
Maintained	33	37	43	52
Independent	51	37	31	26
Direct Grant	13	24	24	17
Others	3	2	2	5

Table Two
Percentages of applicants and entrants from each type of school who have "very good" A level results (1 to 13 to 15 points). Post A-level entry for 1977

	Male applicants	Male entrants	Female applicants	Female entrants
Maintained	50	72	54	70
Independent	59	68	62	62
Direct Grant	57	74	65	66

Table Three
Percentage chances of acceptance for candidates from each type of school by category of A level results. Entry for 1977

	V-good passes (13-15 pts)	Good passes (9-12 pts)	Passes (3-8 pts)	Pre A level	All
Maintained men	97	43	14	47	51
Independent men	77	41	16	41	52
Direct-grant men	74	41	26	31	34
Maintained women	72	43	12	37	45
Independent women	72	43	16	41	46



Christ Church, Oxford.

Poor get less poor but the rich stay rich

Oxford is more expensive than most other British universities. It finds some of the extra money from fees and university endowment income, but the charge per student head on public funds is still higher than average.

In 1973-74 (the latest year for which comparable figures are available), the grant for income per student in all UK universities, excluding Oxford, Cambridge and London, was £1,460. Oxford University itself received only £1,244 per student from the Exchequer and from student fees. The colleges received an extra £356 from student fees. On this measure, then, Oxford costs the public purse some 9 per cent more than other universities in the UK. But, since Oxford has more overseas students than other universities and more self-supporting graduates, a more accurate figure might be 7 per cent.

This figure is necessarily a crude estimate that takes no account of the different compositions of the universities (Oxford has more graduates than the others but, generally, fewer scientists and technologists), nor of the non-teaching activities that universities are expected to perform.

Oxford also receives a further £430 per student in endowment income and donations, while others receive only £14 per student.

Where does the extra money go? The published college accounts are not sufficiently informative to draw detailed conclusions. Though the headings in the accounts are standardized, what the colleges choose to put under them is not. The famous Common Table, at which fellows may get free meals once or twice a day (depending on their college), sometimes with wine and meals for guests thrown in, is an example. It is up to individual colleges whether they include the costs of servants and cooking fuel. The £296,248 than was listed in the 1973-74 accounts under Common Table works out, at between £150 and £200 per don. In cost-per-student terms, it accounts for £20.

Compared with other universities, Oxford spent an extra £160 per student on paying the salaries of its teaching and research staff (Oxford's dons are better paid than most), and an extra £93 on its libraries. The library money is explained by Oxford's more decentralised and diverse library system.

Other extra costs at Oxford are accounted for by the maintenance of older premises and administration of the college system.

But to concentrate on the differences between Oxford and other universities is to ignore the equally striking differences between the Oxford colleges themselves.

In 1974-75, the richest college (Christ Church) had a statutory endowment income of £653,454, while the poorest (St Catherine's) had £12,054. The statutory endowment income is calculated for the purposes of the college contributions scheme, set up on the recommendation of the Franks Commission. The scheme taxes the richer colleges and distributes revenue to the poorer colleges as capital with which to build up their endowments.

The poorer colleges are now on a more secure financial footing, but the contributions scheme has had only a minor effect on the inequalities between colleges. Christ Church still had £425,917 available for its own purposes even after paying its tax. And, with the richer colleges able to invest for capital growth and, in some cases, to exploit the land and property boons of the past 10 years, the gap between the endowments of the rich and the poor may have increased.

How do the rich colleges spend their extra money? Some bursars say they reduce the cost to the public purse by not charging fees. But, excluding All Souls and the postgraduate colleges, the difference between the highest and the lowest fee income in 1974-75 was less than £150,000, and the difference between colleges of comparable size was even smaller.

Nor is there much evidence that the richer colleges subsidize their undergraduates in board and lodging charges.

Comparison of the accounts shows that the richer colleges are likely to have more dons and, in particular, more junior research fellows. They are more often able to pay the maximum university stipend, and to offer better fringe benefits. The richer colleges can also afford better-equipped and better-staffed libraries, more regular maintenance, more offers of research studentships and prizes and better student accommodation and facilities (particularly for graduates).

Increasingly, both the UGC and the local education authorities are asking awkward questions about how the college money is spent. Now that the colleges receive around 45 per cent of their income from fees, and their fellows are heavily subsidized by the university, they can hardly argue that it is their own business.

There is a move to establish a common college fee. And there are signs of more coordination between colleges over things like library catalogues and catering supplies.

Balliol—the clever college

Balliol is traditionally Oxford's cleverest college. But it slipped to fifth place in the Norrington Table last summer and was narrowly pipped by Magdalen for the highest number of firsts (22 against 21). This is widely regarded as failure. Indeed, on their records over the last decade, Corpus Christi and Merton might now have stronger claims to pre-eminence.

Balliol's reputation for cleverness dates back to the nineteenth century, when it was one of the first Oxford colleges to take open examinations seriously and challenge the leisurely, gentlemanly traditions of the past.

The college was founded in the middle of the thirteenth century and one of its earliest masters was John Wycliffe. But its most famous head was Benjamin Jowett (of whom it was claimed that what he knew not was not knowledge), almost the last man in Oxford to appear before a university court for heresy. That is a source of great pride to the current Master, ex-Communist Party member and controversial Marxist historian, Christopher Hill. Balliol has one of the most advanced systems of student representation in Oxford—the students have five out of 21 places on the key executive committee—largely because of Hill's support.

More than a quarter of Balliol's 430 students are graduates—the highest proportion of any undergraduate college. It also has a high concentration of social scientists with more PPE men (accounting for more than one-sixth of its undergraduate intake) than any other college.

Languages 'to learn in spare time'

What Balliol does not have, in any quantity, are geography or theology students. And, until recently, it did not take students to read modern languages, apparently on the grounds that Jowett thought anyone worthwhile ought to be able to learn a language in his spare time. Now it has a small cohort of modern linguists, and its first languages fellow was also its first woman fellow. She is Mrs Carol Clark, who says that the minority in Balliol who are not pleased to see a woman there are, in any case, the very people who would have scruples about being unpleasant to women—"so everyone is very friendly".

Nevertheless, Balliol still does not have female undergraduates, even though it originally planned to join the five experimental mixed colleges in 1974. It backed out largely because it did not like the quota regulations. Being Balliol, the college decided to be still more awkward and, along with New College, asked the Congregation for permission to change its statutes to admit women fellows immediately and women undergraduates "at a later date". Later Balliol reluctantly agreed to fall in with the university's line that it must await an official go-ahead for women undergraduates even though it does not accept that the university has any right to prevent it admitting women on any terms. "We may have a moral obligation", Christopher Hill says, "but not a legal obligation."

Somewhat to its embarrassment, Balliol is a comparatively wealthy college. Its statutory endowment income in 1974-75 (the amount liable to taxation under the college contributions scheme) was £232,036, making it Oxford's tenth-richest college. Its financial security was greatly boosted by a private 700th anniversary appeal in 1963, which raised the remarkable sum of £1,050,000. It spent half of this on new buildings (including a graduate centre and a sports pavilion) and half on the creation of new fellowships. The majority of its endowment income is from interest and dividends—the college sold its last agricultural land in the mid-1960s. It owns several blocks of shops in towns like Solihull, Petersfield, and Chippenham.

Some of Balliol's overheads appear relatively high. This, Brigadier Jackson, the Bursar, says, is because "we pride ourselves on paying our domestic staff a decent wage." The students benefit from some of the lowest charges in the university. Balliol's room rents are graded, with position (on the quiet inside or the noisy outside of the college) as well as room size, determining the price. But wherever they live in college, students are unlikely to have a view of anything but the most stunningly inelegant architecture, looking like something out of a Gothic fantasy.

Balliol's old boys tend to be famous, successful, and well-heeled—hence, the results of the 1963 appeal. Its former students include Harold Macmillan, Ted Heath, Roy Jenkins, Denis Healey, Beveridge, Tawney, Cole, Namier, Swinburne, Matthew Arnold, Gerard Manley Hopkins, and Graham Greene. More than 50 per cent of the current staff took their first degrees at Oxford; and nearly one sixth come from overseas. The remainder are more or less equally divided between Cambridge, London and Scotland, with a Liverpool graduate providing the solitary representative of an English provincial university.

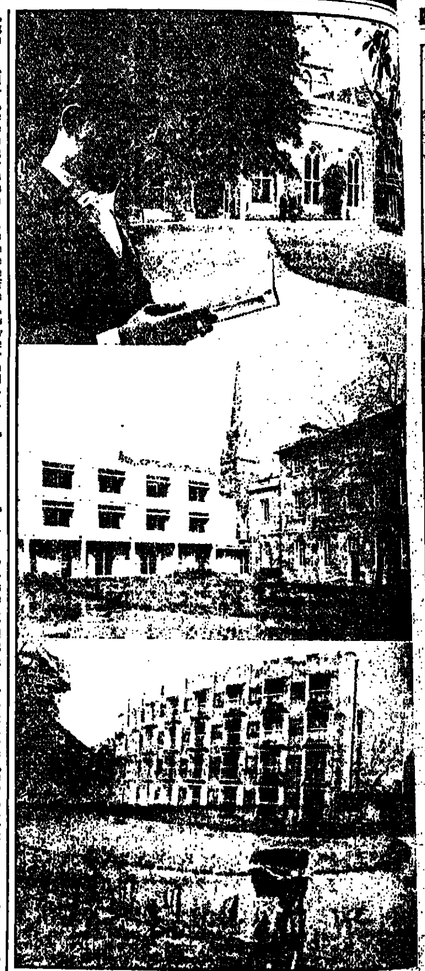
The students are fairly mixed, although the maintained school entry is slightly lower than for Oxford as a whole. Maurice Keen, the admissions tutor, makes the ritual noises about the entrance examination being a handicap (with the public school entrants carrying heavier weights) but makes rather less of it than some of his colleagues in other colleges. The college has several closed scholarships for such schools as Winchester, Clifton and Newcastle Royal Grammar. Keen says that, if the scholarships are filled, the student must be "approximately equivalent" to the standard of an Exhibitioner. The college also has a long tradition of a cosmopolitan entry: when Charles Ryder, in *Brideshead Revisited*, watched the Oxford church-goers "in a world of piety" on a Sunday morning, "Tom proud infidels alone proclaimed their dissent: four Indians from the gates of Balliol, in freshly-laundered white flannels and neatly pressed blazers with snow-white turbans on their heads . . . making for the river".

Three essays a fortnight

The JCR, physically, is the most spacious and the most well provided in Oxford (the pantry serves five meals a day). Politically it has a tradition as the most left-wing in Oxford although it is currently rather subdued. The college has always cultivated an "anti-hearty" image, yet it is now winning a few sporting cups and it has always had its share of dining clubs, including one for boatmen (with an after-dinner tradition of attacking neighbouring Trinity).

Balliol puts a great deal of emphasis on teaching, and many students have two tutorials a week and have to write three essays a fortnight (the Franks committee thought that this kind of load was excessive), but Geoff Chambers, the JCR President, says that the tutors are "willing to give you rope to hang your self". In other words, you can decide you would prefer a rowing blue to a first and, according to Chambers, "they don't get upset about it."

There is a certain superiority and self-confidence about Balliol; it believes that it will always be on top, anyway. Fewer Balliol undergraduates consult the university appointments committee than in any other college. The atmosphere is not to everyone's taste but, reassuringly, Carol Clark told me that, while the SCR was not strong on mortgages and deep freezes, it did not talk about the meaning of existence, either.



Top to bottom—above: Balliol, St Peter's, St Anne's. Right: Christ Church, St Edmund, Nuffield.

St Peter's-the poor college

St Peter's was opened in 1929 as a permanent private hall, mainly for poorer students intending to be ordained. It was the evangelicals' answer to Keble. The founder was a retired Bishop of Liverpool, and the first Master became Bishop of Rochester. Its chapel was built in 1874 as a parish church and, until 1961 the Master was also the Rector. Although the college retains a vaguely ecclesiastical air and has a strong Christian Fellowship, the current Master, Sir Alec Cairncross, professes the new and more sinister religion—economics. He was economic adviser to the Government from 1961 to 1964, then head of the Government Economic Service until 1969.

Sir Alec, a Glasgow graduate and now Chancellor of that university, is one of the few senior college members with a non-Oxbridge background. Nineteen of the fellows and lecturers took their first degrees at Oxford, six at Cambridge, two in Scotland, two in the Republic of Ireland, and one overseas.

St Peter's is a smallish college (250 undergraduates), but prides itself on the friendly atmosphere. Of its undergraduates, 45 per cent are science-based, compared with the Oxford average of 34 per cent. Only six other colleges have more mathematics students. There are no Greats fellows.

St Peter's did not become a full college, with a charter, until 1961. The charter requires a three-quarters majority of the fellows to change the statutes to admit women, and the college is currently struggling through that procedure. There is some opposition to going mixed from a few older fellows, such as the senior tutor, Reg Perman, who is worried about the future of St Peter's rugby, already in decline after the college reached the finals of Cuppers several times in the 1950s. But women might strengthen the college's reputation for good music.

The college vies with St Catherine's (the only other college founded this century) for the distinction of being Oxford's poorest college. Its statutory endowment income in 1974-75 was only £41,377. The college contributions scheme, however, has raised the value of its endowments from £100,000 in the mid-1960s to £750,000 at present. Poverty means high fees: £685 a year for undergraduates, £384 for graduates, and £147 a term for board and lodging, excluding lunch. Fellows get two free meals a day, but dine modestly. When I was there for the day lunch consisted of fish and chips followed by cheese and biscuits.

Former students include Ken Loach, the film director; the Rev W. F. Lofthouse, editor of *Thomas the Tank Engine*, and Carl Albert, Speaker of the US House of Representatives. The college has strong links with Birmingham grammar schools with Birkenhead School and Aylesbury Grammar among its most prolific sources of talent.

The college is not noted for academic prowess. Its score in the Norrington Table is usually below average, and it was the bottom college in 1968. But, in recent years, its performance can be described as "fair to middling", especially in view of its unglamorous reputation, and in 1975 it came sixteenth out of 28 colleges.

In the Franks report, St. Peter's emerged, alongside Wadham, Pembroke, Jesus, St Catherine's and Queen's, as one of the men's colleges with a relatively low proportion of public school entrants. It retains a strongly state school entry.

Jeremy McGahan, the JCR president, says that student-staff relations are good. (He originally went to the college, he says, because they sent him such a nice letter.) The students have observers on the governing body. They have now acquired their own bar, after having to borrow one on three evenings a week for several years.

College customs include the presidential egg race, in which the newly elected JCR president and his predecessor propel eggs round the quad with their noses, while drinking four pints of beer. The students' fondness for eccentricity is illustrated by their formation of a Notsy Aurora Society, the aim of which is to report such phenomena to the astronomer, Patrick Moore. This is good clean fun, washed down by strong ales. The college was once known as Pot Hole, but the well-informed undergraduate of today knows it as long redundant.

St Anne's-for women

The largest of Oxford's five women's colleges, St Anne's originated in 1879 as the Society of Oxford Home Students. It did not become a full college until 1952. Its spacious site is 10 or 15 minutes' walk from the city centre (one of the curiosities of Oxford is that everyone behaves as if even the horse, let alone the car or the bicycle, had not been invented).

Like all women's colleges, the largest subject is English, with modern languages not far behind. The standards in English are outstandingly high but, according to the Oxford students' prospectus, "the approach is tense, unimaginative and geared to the 20-page essay". The college is not keen on allowing its English students to go elsewhere for their tuition except for special subjects, so the inmates have to put up with the college grindstone. Students at St Anne's told me that nobody would dream of failing to deliver an essay on time, that it was almost unknown for a student to address a tutor by her Christian name, an dthat gowns have to be worn when students go to see the Principal. In all this, St Anne's is probably no worse or better than any other women's college.

The students are in favour of admitting men to the college, but their enthusiasm is more tepid than you might expect. A representative of the Middle Common Room thought that, once men were there, they would run the place and junior members thought that all colleges tended to be unadventurous-looking; St Anne's students, they said, were "nice" to look at for their entertainment.

For the moment the college retains its somewhat archaic hours, with visitors supposed to leave by midnight (2 am on six days). But nobody checks at night visitors and, in any case, back wall is the lowest in Oxford.

Apart from its own meagre buildings, the college owns no land or property. Before the college contributions scheme was introduced the value of its endowments was £25,000. It has only one or two research fellowships and no meagre perks to its dons. Like other colleges are raised, Oxford Holtrust, the most recent university, may become a disadvantage in attracting staff.

For the students, college life means high fees and cramped rooms; they are scientists, a minority in teaching outside. Nevertheless, college's vacancy rate is low, income of £76,157 in 1973-75 was highest of all the women's colleges.

The academic record is erratic, veering from 19th in the Norrington Table in 1968 to 3rd in 1971. It has now settled to a consistent place around the middle table, and the proportion of firsts and seconds is around 50 per cent.

When Franks reported in 1966 it had the lowest proportion of maintained school entry (just over 40 per cent) of any women's college.

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at 55 per cent, the maintained school entry is above average for women's colleges. Mrs Tronsman says: "We try get as wide a catchment area as possible." But although the college introduced conditional offers last year, the principal is "not wholly satisfied" with the new system. "It is better to compare people at the same point and on the same criteria", she says.

St Anne's is a political (once red, now fading pink) rather than a sporting college. Last summer it was the only college not to have a boat on the river, but it is borrowing one this year and hopes to buy one soon. It is noted for active dramatic and music societies.

The college was the first to have a nursery—to this day, only one other women's college provides one—and places are in heavy demand. The nursery is open 48 weeks a year and the cost is £9 a week.

For its 360 undergraduates and 130 graduates, St Anne's has only 21 fellows, two research fellows, one visiting research fellow and 15 lecturers, which probably gives it the worst student-staff ratio in Oxford. Apart from three overseas dons, there are three Cambridge graduates, two London graduates, one from Wales, one from Edinburgh and one from Kent. All the others took their first degrees at Oxford. The old girls include a few minor politicians such as Baroness Young, a striking number of Fleet Street journalists, Naomi Mitchison, and the first woman barrister in England, the late Dr Eva Williams.

Christ Church —rich college

Christ Church, combining a college and a cathedral in a single legal and financial entity, is the kind of institution that only the English could invent.

Its origins stretch back to the eighth century when a monastery, later developed into the Priory of St Frideswide, was established on the site. This priory, together with some 20 small houses, provided the capital for Cardinal Wolsey to begin in 1525 the building of his fabulous Cardinal College, of which it was said that, had it been finished as it was begun, "it might well have excelled not only all colleges of student, but also palaces of princes".

Alas, Wolsey fell from power. Nearly 20 years later Henry VIII (after having the cardinal's hats removed from all the walls) revived the college as Christ Church and combined it with the cathedral of the new diocese of Oxford. The head of the college is also the head of the cathedral. As the current Dean, the Very Rev Henry Chadwick, puts it: "Henry VIII liked two things for the price of one."

Christ Church clings tenaciously to its traditions. Gowns are worn in Hall, and grace is said in Latin. (There is an informal alternative, but the majority of students still prefer the traditional.) Undergraduates go bengling (very few nowadays, admittedly) and vote Conservative in a proportion of roughly five to one. The dons are called Students, as Wolsey christened them four centuries ago, and they include four canonical professors, three of them appointed by the Crown. When the university tried to secularize the professorships some years ago, it found less than half-a-dozen supporters in the Christ Church SCR.

The college has a Russian prince called Obolensky among its dons (cousin of the man who got famous try for England against the All Blacks at Twickenham between the wars). When Franks reported, 71 per cent of Christ Church's undergraduate entry came from independent schools—by far the highest proportion in Oxford. When Congregation met this month to consider lifting the restrictions on colleges going mixed, six Christ Church dons—more than from any other men's college—were among the signatories to the motion for delay.

All this is part of the college's traditionalist, unreformed image—and it is at least half unfair. A week after the vote in Congregation on mixed colleges, the Christ Church dons agreed in principle, by a substantial majority, that they should re-draft their statutes to allow them to admit women both as undergraduates and as dons. And the college is so anxious to broaden its entry that it has comprehensive school heads to lunch almost weekly.

If they are put off the college, it will be food not the dons' company. Despite its wealth (along with St John's, it is the richest college in Oxford), a ferocious treasurer restricts both the quantity and the quality of self-indulgence—the dons are allowed only one free meal a day, and have to pay for their own dessert, their own wine, and their own guests. The wealth (even after paying its college contributions tax and meeting its exceptional commitments, such as the cathedral, the college had more than £425,000 for its own purposes in 1974-75, compared with St Peter's £36,000) is reflected in the provision of some 15 junior research fellowships.

The college derives most of its private income from interest and dividends, and it has some tenanted urban property (it was criticised some years ago for an excess of zeal in turning out squatters), but it is one of the few Oxford colleges that still gets a substantial proportion of its income from agricultural land.

Oxbridge graduates dominate the college staff. Out of 82 canons, students (equivalent to fellows), lecturers and research lecturers, 48 are Oxford graduates and 17 are from Cambridge. There are only three people who took their first degrees overseas, and the representation of English provincial universities is confined to the lower categories—a lecturer from Manchester and two research lecturers from Exeter.

The student entry is thought to be less biased to the independent school than in the past. But Richard Rawlinson, the JCR President, himself an Old Etonian, says that many of the state school people are "the sort that would have wanted to go to public schools, anyway". His point was illustrated by a man in the JCR hot, who had been to a Kent comprehensive and had a firm belief in the value of elites. "My school was awful. Most of the people there were stupid."

He might have added that Christ Church itself is not noted for intellectual brilliance. The college normally falls in the bottom six in the Norrington Table. But—another indication of how Christ Church is changing—its performance has greatly improved recently, and, last summer, it came 12th in the table with a score exactly the university average.

The JCR is political rather than actively conservative. In a recent by-election for a place on the Oxford University Student Union executive, Christ Church undergraduates behaved in precisely the manner that Christ Church undergraduates are popularly thought to behave. On the first day, the ballot box was thrown in the river. On the second, it was stolen. Once retrieved, it was filled with black ink. Yet the JCR has always been affiliated to OUSU and has always paid its subscriptions.

The undergraduates are pro-Christ Church more than they are pro-anything else. Despite the normal voting pattern, a Liberal standing as a delegate to an NUS conference polled a heavy majority in the college because he was a Christ Church man.

The college is not advanced in provision for formal undergraduate participation in its affairs. Richard Rawlinson says: "We don't bother with formal procedures. We go along and have a chat with the senior people and find a spirit of cooperation if not of agreement. The general view here is that the college is better run by the senior members than by JCR hacks."

In truth, the undergraduates have little to complain about. They have access to superb libraries, including a modern law library, three art galleries, college rooms for their whole three years at Oxford (some of them luxurious), an internationally famous cathedral choir and a palatial new sports pavilion.

Former students include Gladstone, John Locke, William Penn, William Walton, Charles and John Wesley, Lord Hailsham, W. H. Auden, Lewis Carroll, and Sebastian Flyte.

Nuffield—for graduates

Founded in 1937 by Lord Nuffield (who donated a site and some £900,000 for endowments), Nuffield College is "for postgraduate work especially in connection with the study by cooperation between academic and non-academic persons of social (including economic and political) problems". Its 79 current students are roughly equally divided between economics, politics and sociology. Twenty-three of them are Oxford graduates, four are from Cambridge, one from London, 15 from overseas, 11 from provincial, Scottish and Northern Irish universities, and one is a polytechnic graduate.

Nuffield was the first mixed college in Oxford and, this year, there are 11 women students. Since Jean Floud's departure, however, there has been no permanent woman fellow.

The college is the home of David Butler (Nuffield election studies), A. H. Halsey (social mobility study), Jim Sharpe (local government study) and Phillip Williams (Gaitskell biography). The atmosphere is severely empiricist—there is little interest in theory or ideology except among the economists.

Nuffield prides itself on its involvement with the world of practical affairs. Fellows love to drop the names of politicians with whom they have lunched. Most have had a spell in the Civil Service or advised the British or some foreign government. Sir Norman Chester, the Warden, once observed that "the problem is not how to create links, but how to retain the measure of aloofness necessary for an academic judgment".

The college also has a set of visiting fellows who include Jack Jones, Sir Robert Mark, William Whitelaw, Sir Campbell Adamson, Len Murray, Eric Varley and Sam Brittan. The honorary fellows include Edward Heath and Jim Callaghan.

Sir Norman admits that there is "a gap between the concept and the practice of the visiting fellows". Most of them are too busy to turn up more than once or twice a year. Some students complain that, when the fellows do visit, they are not asked sufficiently probing questions and that students have too little opportunity to talk to them.

A stone's throw from the railway station, the buildings attempt to look old but are, of course, new. The result is that one is reminded of almshouses. But the study facilities are superb: a library with liberal lending laws, a free Xerox service, a computer and studies for all the students, whether they live in or out of college.

The trouble, as some students pointed out, is that there is little cause or incentive to wander out in the college. The social life is somewhat restrained, even strained. Nobody goes in for wild or unusual behaviour, perhaps because the college is built in such a way that everyone can see what everyone else is doing all the time.

And the college is essentially an academic waiting room, in which there is growing anxiety that the train carrying jobs is no longer a reliable service. The great majority of past Nuffield students are now in university posts.

The college minimizes distinctions between senior and junior members. The students have representatives and voting rights on all bodies, including the governing body. Though they are excluded from "below the line" business (such as student progress reports), the student representatives are the full minutes.

Students and dons eat at the same tables, taking their seats according to the order in which they enter the dining hall. If you find yourself next to a stranger on such occasions, the usual opening gambit is: "What is your research field?" More profound academic discussion is said to take place over afternoon tea.

The college is not athletic, nor even particularly political. But there is a strong and active football team, encouraged by the Warden, who has close connexions with the Football League.

Measured solely by its 1974-75 endowment income, Nuffield is Oxford's third richest college, after St John's and Christ Church. The Warden refuses to reveal the value of the endowments on the grounds that it would cause "either jealousy or misunderstanding". But they cannot be less than £6 million.

Warden Chester is due to retire in August, 1978. In a circular Francis Seton, senior fellow, has implored college members not to gossip about the progress of the election of his successor because "this can be highly damaging and prejudicial to the common objective". At risk to "the common objective" (whatever that may be), some members speculate that the likely successor is Hugh Clegg, former Nuffield fellow and now professor of industrial relations at Warwick.

St Edmund Hall-hearty

"Teddy Hall", as it is known, is the only survivor of the many small academic halls that flourished in the Middle Ages, but which were killed by the advent of the colleges. It did not become a full college until 1957, and therefore has the curious distinction of being one of the oldest foundations yet one of the youngest colleges.

This peculiar history, allied to relative poverty (statutory endowment income in 1974-75 was £80,592), accounts for the college's image of hearty, sporting prowess. Success in games has been its way of making a mark. It does not have a very distinguished academic reputation. It came 16th in the Norrington Table in 1969, but it reached bottom place in 1975. Last summer it improved slightly to joint 24th.

The year it came bottom was also the year in which it won cuppers in rugby, football, second football, badminton and seven-a-side rugby.

Students and dons are now anxious to dispel the college's unfortunate image, even though "misuse of fire alarms, and fire-fighting equipment" persists in getting on to the agenda at governing body meetings. Edward Gray, the president of the JCR, says that students are now "quieter, more academic and smaller".

Traditionally the most right-wing college in Oxford, Teddy Hall was this term the base for Oxford's Chile Action Week and the JCR recently voted money to the strike committee at the Randolph Hotel.

The college has always been in the forefront of technology development at Oxford. It was the first to appoint tutorial fellows in engineering, geology and metallurgy. Today it has more undergraduates in these subjects and in physics than any other college (except that Keble have a few more in engineering). The college is also strong in English, and has more undergraduates in that subject than any men's college except Pembroke. It stopped admitting Greats students about 10 years ago. It has research fellows in industrial relations and in computing.

There is only one closed scholarship (it is for the sons of Church of England clergy, and is shared with 10 other colleges) and the college has a relatively high proportion of students from state schools. It has a policy of encouraging mature students—what Dr E. R. Oxburgh, the admissions tutor, calls "people from funny backgrounds without high A level scores, on whom we take a risk". The gamble, he says, usually pays off. The college's entry in the university prospectus makes the unusual statement that, while it admits, in the first instance, those likely to do better academically, "we also consider their ability to gain from college life and to contribute to it".

Relations between students and dons appear to be easy. The JCR president has a standing invitation to High Table supper on Wednesday evenings, and can attend governing body meetings when student concerns are being discussed. The principal, the Rev J. N. D. Kelly, who has been in office since 1951 and is, therefore, the longest-serving college head in Oxford, is said to appear sporadically at student discos.

Despite being one of the largest colleges in Oxford (341 undergraduates), Teddy Hall is noted for its intimacy, perhaps because it has a very compact site. The college's poverty, however, means that a few student rooms still lack easily accessible running water, necessitating journeys across the quad in the small hours for the harder drinking inmates. It causes some resentment that, no matter what the facilities in your room, you have to pay the same rent. Another source of friction concerns the college's anxiety to maximize its conference income and, therefore, to ease students out of their rooms during vacations.

Teddy Hall pioneered the use of colleges as vacation conference centres, and it is now in the forefront of plans to offer accommodation to tourists. The college has also been marketing its own sherry in America for some years. Meanwhile, the college contributions scheme has boosted its meagre endowments. About £300,000 of the money it has received under the scheme is used to help finance 126 undergraduate rooms, a new common room, a dining hall, new kitchens and the conversion of a redundant parish church into a library. Its investment in spacious dining facilities and expensive equipment has meant a vested interest in intensive student use and the charges, therefore, are low enough to attract customers from other colleges.

The college inevitably has its share of dining and drinking clubs, including a Black Velvet Club, for which the qualification is drinking eight pints of Guinness. One college bloke makes an award for beer gut of the year. It is doubtful, though, that any of these customs are as long-standing as romantics like to imagine.

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The Royal Institute of Chemistry celebrates its centenary next week. L. H. W. Hallett describes the institute's continued interest in higher education

Keeping standards high in chemistry

In the 1870s the advance of chemical knowledge was gaining momentum in Britain, and was enabling chemistry as a technology to make a belated but decisive contribution to the Industrial Revolution. Chemists were needed as designers, research workers, analysts, plant managers and salesmen and their services were also in demand in the fields of public health, control of pollution and prevention of the adulteration of food.

There was, however, no institution outside the universities and major technical colleges that could protect the public from the chemical charlatan by defining a properly qualified chemist, or could serve the new profession of applied chemistry as the engineers were served by the Institutions of Civil and Mechanical Engineers.

The Chemical Society, founded in 1841, was a learned society, and its members thought that professional matters were inconsistent with its charter. Accordingly, after what we should now call a "feasibility study", the Institute of Chemistry of Great Britain and Ireland was constituted in 1877, and received its royal charter in 1884. (It was not until 1944 that it was granted the prefix "Royal" and its title shortened to the Royal Institute of Chemistry in a new royal charter granted in 1949.)

In the early years all the chemists of sufficient distinction to serve on the council of the institute had to be drawn either from industry or the public service, or from the chemistry departments of universities. The first president, Professor Edward Frankland, for example, came from the Royal College of Chemistry, and many of his successors, as well as members of the council, examiners and honorary officers have been (and still are) drawn from the professorial ranks.

Thus from the beginning an intersection was established at a high level between academic and industrial chemists and the institute; these chemists—and most of them were members of the Chemical Society—found it possible to combine the advancement of knowledge and of its applications in the outside world with an active role in the government of the profession.

The most urgent problem facing the institute was the need to define what was meant by a qualified chemist, and to decide the criteria to be used in setting up standards of education and training for chemists. This was a formidable task, but it was tackled with the energy and sense of purpose characteristic of the Victorian era.

It was decided that the final examinations for the associateship (the main membership grade, now renamed "membership") would be set by the institute itself. At first only practical examinations were set but within a very few years there were also papers at a high standard in theoretical chemistry. These bore a strong resemblance to final degree papers, which was hardly surprising since the examiners were usually university men.

Naturally there were those who thought that honours graduates in chemistry should be exempted from at least the theory papers, but the institute held the view that its own examinations were necessary to demonstrate the full professional competence of those who could pass them, and it was not until 1920 that the regulations were changed. Even then full exemption was restricted to those who obtained an approved first- or second-class (good) honours degree from a recognized institution.

Further developments came from an unexpected direction. In 1920 the institute agreed to participate in forming a joint committee to administer the newly created National Certificate scheme, and at once became involved with a wider spectrum of technical colleges.

Although Ordinary and Higher National Certificates were not formally connected with the institute's own qualifications—and indeed no exemption has ever been given for any part of the final examinations for success in an Ordinary or Higher National Certificate—it was inevitable that in the course of time more colleges would attain the standard of teaching and resources that would enable them to be recognized for training students to the associateship level.



"Theory and practical application": the timely motto on the Royal Institute of Chemistry's armorial bearings

In these developments the institute played an important part, through its policy of periodic inspection and approval of colleges, in encouragement to colleges to raise educational standards and in persuading local authorities to provide the necessary resources.

A point was reached in 1957 when it was possible for five colleges, at Birmingham, Bristol, Hull, Liverpool and Salford, all of whom had an outstanding record in preparing candidates for associateship of the institute, to be placed in "special relationship", to set their own examinations subject to moderation by the institute's examiners, and within limits to devise their own curricula.

The "special relationship" scheme was extended in 1968 and again in 1971, so that now all recognized colleges, organized into groups, set their own examinations; meanwhile three of the original five colleges passed through the stage of colleges of advanced technology to become universities in their own right.

From the beginning the institute had always insisted on the standard of a good United Kingdom honours degree for its grades of corporate membership ARIC and FRIC (Fellowship) although no formal postgraduate professional experience was required.

There were those who objected that this was not consistent with the original idea of a professional chemist, especially since many universities were beginning to abandon formal practical examinations at final degree level.

In 1956 the regulations were changed to introduce a transitional grade of graduate membership, from which stage at least two years of approved experience were required to gain the associateship. For this purpose both teaching and research in chemistry were accepted as approved experience.

By this time the gap between the levels of Higher National Certificate —which has flourished considerably, particularly in the postwar years— and graduate membership had widened, so that a significant number of students with [illegible] qualification felt themselves disadvantaged by the lack of professional status.

In response to [illegible] from many sources, [illegible] teachers in the National [illegible] colleges, the council introduced in 1962 a new corporate [illegible] grade, requiring a standard good ordinary degree in [illegible] or applied chemistry, [illegible] one year of approved [illegible]

This new grade of [illegible] proved extremely popular [illegible] tive (there are now 5[illegible] tiates) and, among other [illegible] ments, it led to the [illegible] interesting new courses in [illegible] ics as advanced analytical [illegible] try and polymer chemistry [illegible] were very appropriate in [illegible] of industry.

The institute has been a [illegible] on its resources. It has also [illegible] a programme of inspection [illegible] approving its recognized [illegible] and it has a deep interest in [illegible] cal education at all levels [illegible] school to postgraduate [illegible] However, resources have [illegible] 1972 the memberships of [illegible] the Chemical Society, the [illegible] Society and the Society for [illegible] cal Chemistry were merged [illegible] view to eventual complete [illegible] mation, so that the [illegible] sources could be more [illegible] employed.

At this stage the [illegible] ferred its direct participation [illegible] education to the newly [illegible] education department of [illegible] cal Society which, through [illegible] cation division, promotes [illegible] workshops, discussion [illegible] over the whole gamut of [illegible] education. Its members [illegible] universities, polytechnics [illegible] of further and higher education [illegible] schools, and the opportunity [illegible] cooperation at all levels has [illegible] been taken.

The Chemical Society [illegible] tains committees of heads [illegible] versity chemistry departments, [illegible] polytechnic chemistry departments [illegible] which were originally [illegible] the institute, and is a member [illegible] the British Committee for [illegible] Education of the Royal [illegible] Thus the traditions of the [illegible] Institute of Chemistry are [illegible] amply maintained not only [illegible] own special areas of activity [illegible] also in association with these [illegible] Chemical Society, from which [illegible] future of chemical education [illegible] only benefit.

The author is head of the department of chemistry at the Polytechnic, and was vice-president of the RIC from 1970 to 1972.

Medical education for the people

Geoff Watts speaks to the director of Mozambique's single medical school

When, in 1975, Mozambique acquired full independence from Portugal, large numbers of the country's white settlers responded with an immediate and unqualified demonstration of their feelings about the new regime—they left.

Most returned to Portugal; others moved on to South Africa, Rhodesia or similar countries that seemed to offer a promise of the kind of colonial lifestyle to which they were accustomed. Among these emigrants was a significant proportion —the exact figure is still contested —of the staff of the country's only university.

Last month I asked one expatriate British lecturer, now working at Eduardo Mondlane University in the capital, Maputo, whether this had created enormous problems for those who chose to remain. It seems not. After all, I was told, most of the students left too.

Keen to turn adversity to advantage, the Mozambicans used the exodus as an opportunity to revise the university's objectives, and to this overhauling the curriculum. As Dr Carlos Marzagão, director of the university medical school, sees it: "The changes went smoothly precisely *because* the reactionary teachers had already left. All those who'd all remained, all defending their own corners, change would have been impossible."

Dr Marzagao is a slightly-built man with a galvanizing energy, a pronounced South African accent (incongruous for one in his position) and an unrestrained enthusiasm for the new Mozambique and all its medical works. Now Mozambican by nationality, he took over as director of the medical school at the end of 1974. "I'm still very much the new boy here, but I've learnt so much in these two years and I'm still learning", he says.

Many of these changes have been predictable, the reforms that might be expected of a university in any country newly embarked on the transition to revolutionary socialism. Collective control is one example.

Gone are the days of academic autocracy when the director had the final and absolute say in every decision; the faculty of medicine is now run by a *comissao directiva* comprising two student representatives and two staff members, besides Dr Marzagao himself.

Teaching methods have also been revised; the formality of the lecture theatre is giving way to student presentations and teaching by discussion. Dr Marzagao speaks disparagingly of the teaching methods of the colonial era. "Professors would come from Portugal to give prestige lectures with many slides. For them it was a kind of holiday", he says.

Today the emphasis is on practical work, with the students learning by their own mistakes. Or in Dr Marzagao's almost gleeful description: "They do it, and if they do it wrong they are smashed against the wall." Figuratively speaking, at least.

It is the revision of the curriculum, however, that will most profoundly affect the kind of medicine the school's graduates eventually practise.

Health care in colonial Mozambique followed the curative pattern familiar throughout most of the developed world. As such it was designed primarily for the whites, and for that small proportion of the blacks judged by the Portuguese to be "assimilated", a euphemism for civilized.

As many as 70 per cent of black Mozambicans had little or no access to doctors or medicine, and such services as the colonial government did provide appeared to be virtually an afterthought.

The new independent government, reversing the old priorities, has chosen to stress preventive medicine for all—vaccination, the elimination of malnutrition, better sanitation and so on—rather than curative medicine for the few. To continue with a course that produced graduates more fitted to work in Western Europe than in Africa would have been absurd.

The country had to start training doctors who saw their futures not in the profitable delights of a private practice in the capital, but in hard work and long hours at some poorly-equipped clinic up-country.

Until recently, teaching on community and preventive medicine was limited to one series of lectures in the fourth year. In the future, says Dr Marzagao, "community medicine will be a theme running through the entire course.

"Many of our ideas are still being developed, but it's clear we must teach our students more about the politics of medicine. For example, before independence the students learnt only about the science of drugs. Now we must teach them about the sociology of drugs—about prices and advertising techniques", he says.

The medical school's policy of learning while doing has practical as well as didactic advantages. Mozambique's ten million or so people have only about 250 doctors, and medical skill is therefore a valuable commodity.

The medical school is next to Maputo's Central Hospital, and from their fourth year onwards the students act more or less as junior housemen. In Dr Marzagao's cardiology clinic they carry out the initial examination, take the case history, and measure blood pressures—all before Dr Marzagao himself sees the patient.



Dr Carlos Marzagao, director of Maputo medical school

At the beginning of 1975 the medical school had 480 students and 18 lecturers; after independence the student body fell to 150 and the teaching staff now numbers just two. Consequently, most clinical teaching depends on the doctors of the Central Hospital who manage it as and when they can—an *ad hoc* arrangement typical of many such in a country short of almost every skill there is.

In terms of space, if not of teaching staff, the medical school is still much undersubscribed. The annual intake of students could be as high as 70 or 80 or even more; in fact, last summer saw only 23 enrolments.

The obstacle to expansion is a shortage of young people with basic schooling, a privilege hitherto reserved mainly for whites. So for the present, whites continue to make up a majority of the students.

According to Dr Helder Martins, Mozambique's minister of health, the final years of colonial rule saw ing more money into the medical school than into Portugal itself.

This public relations [illegible] as the minister describes [illegible] left the school with [illegible] buildings, none of which [illegible] than 10 years old and [illegible] which have only recently [illegible] ready for use.

But, according to Dr [illegible] "nobody really bothered about [illegible] thing before Independence [illegible] floor of the main lecture [illegible] wasn't polished for six years [illegible] roof leaked and nobody [illegible] to fix it. We cleaned [illegible] anatomy department and [illegible] bits of dissected bodies [illegible] been lying around since [illegible] one cared."

Now, clearly, they do. [illegible] born of national indepe[illegible] apparent in the medical school [illegible] is in most other aspects of [illegible] lican life. And with the [illegible] from director to ball [illegible] ing in not just the weekly [illegible] meetings but the work [illegible] organized to deal with [illegible] chores around the [illegible] much proclaimed "collective [illegible] ability" starts to take on [illegible] meaning.

The growth of realism in student politics

Rolf Dahrendorf's interesting and stimulating article in the *TIMES* (March 11) harks back, together with some aging student revolutionaries, to the heady days of 1968. He contrasted the optimism of the 1968 students with the essentially defensive and fearful response which he believes characterizes 1977.

This central thesis was illustrated both by reference to general social trends, and by alluding to some surface considerations. I believe that this presentation contains some elements of truth, but fails to identify the most significant changes.

The size of the student movement has dramatically expanded. In 1968, the National Union of Students had 366,000 full-time student members. Eight years later, in 1976, there had been an 82 per cent increase in size to 668,000. Over the same period, part-time student membership increased from 1,340 to 169,740.

Significantly also, the proportion of full-time university students in membership dropped from 44 per cent to 37 per cent in the same period. This expansion has come from the overall increase in student numbers, the unions' 1971 merger with the Scottish Union of Students, and from significant increases in union organization among further education colleges. The overall impact of these changes has been enormous.

Most important, the aspirations of students have changed. No longer can the average student assume that he will get a job in higher technical, administrative or managerial professions. Expectations have changed and with that the student movement as a whole has become bound closer together.

A parallel development has been the growth of trade union organization among white-collar workers (notably NALGO, TASS, ASTMS, AUT and the civil service unions), and the closer relationship of these unions to the TUC.

An ideological identification with the working class which is supposed to identify the students of 1968 has been supplemented—and possibly even supplanted—by a hard-nosed economic identification with the interests of the labour movement as a whole.

Expressions of this identification of interests were widespread during the 1970-74 Conservative Government. Students sought to give concrete support to industrial actions against government policies, the most significant being the 1972 miners' strike.

Many students and trade unionists identified the Conservative Government's Industrial Relations Act, and Mrs Margaret Thatcher's consultative document upon student union autonomy, as attempts to weaken democratic organisations. This was the period when the growing identifications of interests between student unions and trade unions found its first tentative expression, in a way which had never before happened.

The past four or five years have seen increasing expression of this identification in organizational terms. Student unions have observer representation on most local trades councils, and have joined trades unions in joint union campus committees in most polytechnics and universities.

The public sector trade unions and the NUS, at both local and national levels, have acted jointly against public expenditure cuts; indeed the NUS was alone among non-TUC affiliates in attending last Tuesday's national conference discussing means of acting more effectively against the cuts.

The disputes agreements between the NUS and certain other trades unions organizing workers in the academic sector represent a move towards (but by no means yet an achievement of) a qualitatively different relationship between students and campus workers, particularly at times of dispute. In the field of employment, the NUS is beginning to form effective relations with those trades unions organizing in occupations into which students are likely to go.

All this is evidence of a qualitatively different situation from that which existed in 1968, and I believe that this is a permanent shift consequent upon the changed aspirations of students. It is a shift which is intensified by, though not dependent on, the worsened economic situation.

In addition to the issue of relations between students unions and trades unions, a second development is the changed position and status of the National Union of Students.

It is no coincidence that the level of student activism has increased dramatically between 1968 and 1977. The number of student unions in dispute has increased from a very optimistic 30 (including the historic Hornsey and Guildford art colleges) to over 150 in the teacher education sector last summer on unemployment (of which over 120 were at the stage simultaneously in occupation).

This comparison reflects the fact that the NUS is able now to co-ordinate student unions throughout the country in action against national government decisions. It also reflects the willingness of students in all kinds of colleges to take action in a way which they would not have been prepared to do nine years ago.

The orientation of the NUS is also changing and it is trying in its practice to reflect the fact that well over half of the union's membership comes from the local authority sector. The union's sub-organization closely reflects local education authority boundaries and colleges maintained by the same or neighbouring l.e.a.s come together to plan their approaches to the authorities.

Approaches to l.e.a. councillors and officials are now an integral part of the relationships and campaigns of local student unions. A number of NUS local area organizations meet regularly with their l.e.a., and some have even achieved representation on further education subcommittees.

The net effect of this process, which has really begun only in the last two years or so, is that student unions are becoming less out of touch with the realities of local political life, and that barriers between students and other sections of the community are gradually being lowered.

These changes in the NUS go some way towards explaining the political conflicts which occasionally enter the consciousness of the educational public. The increasing authority of the NUS has led all political groups in the student world to see the NUS and student unions as a focus of activity.

The most significant decision has been that of the Federation of Conservative Students, in 1973, to become active within the union. A similar change in approach has been a feature of the student organizations of all the major political parties. The famous and much-heralded "swings to the right" of the students are partly reflect the fact that all political groupings now see the NUS as a centre of their activity.

These are some of the main trends which differentiate the student movement of 1968 from today. In the immediate past three years, it is the existence of a Labour government which has transformed the situation; the Labour movement conflicts of the Tory years were replaced by the peace and quiescence of the social contract with the Government.

There was inevitably a similar response in the student movement as thousands of students identified with a Labour government in office, supported by the TUC, and wished to give it a chance. The fact that the Labour government carried out broadly similar economic policies to those of the Conservatives did not immediately destroy the loyalty felt by many students, though the NUS continued to press the policies of previous years irrespective of the change of office.

The period of quiescence is now, however, coming to an end, as faith in the Labour government as an agent of any form of positive change has almost evaporated. I have no doubt that student activity will become more, rather than less, widespread. students will not be prepared to sit back without a whimper as circumstances become still worse.

A marked feature, however, which will give concern to many is a generalized lack of faith in the society's democratic institutions. This is not a limited matter—it is widespread and deserves a good deal more attention. The problem facing the NUS and all the political groups within it is to ensure that the great strength of feeling can be directed effectively to achieve the democratic changes which are so necessary.

The alternative, which has so far not yet arrived, is an anguish of dramatic frustration which will end in nothing. The historic link which has the potential to indicate the best way forward is the set of relations between the consciousness of the educational public. The increasing authority of the NUS has led all political groups in the student world to see the NUS and student unions as a focus of activity.



Students: more, or less, political than 1968?

The author is president of the National Union of Students.

A page open to all those who feel they have something of value to say on topics of interest and concern in higher and further education

TALKING POINT

Temporary promotion: a substitute for mobility

Academic mobility as we knew it in the 1960s is rapidly becoming a thing of the past. No longer is it always possible, even in North America, to follow the advice van den Berghe gave to the academic careerist: "Whatever you do, move". Despite the apparent multitude of ads in *TIHES* there is often today nowhere else to go.

A falling birthrate, combined with the manifold pressures of inflation, has meant that in all developed countries academic jobs are becoming thinner on the ground and harder to get. It also has meant that as the possibilities of moving upwards by moving outwards grow less, more academics are trying to move upwards while remaining within their own institutions.

Perceptions of how best to do this will necessarily differ from place to place. If at one institution promotion is made heavily dependent upon research, there will be a Gadarene-like rush away from teaching and administration back to the library and the laboratory.

If at another administration or teaching is perceived as the way up, then academics may feel compelled to neglect their own subjects and make a beeline for the committee room or the tertiary teaching institute. Either way their proper fields of interest will surely suffer.

When it comes to self-justification it is only too easy in today's climate to sit back and rejoice in tenure and the prospect of a reasonable pension.

To avoid this happening on an ever-increasing scale we must try to preserve academic mobility and the benefits that mobility can bring, not only to the mobile individual but also to the institutions between which he is able to move.

One method of preserving a degree of mobility has been tried already, but the results have not been happy. This is the practice of ensuring that junior faculty continue to move around by granting them only limited tenure, if any, and expecting them to move elsewhere at the end of a few short years.

It is a practice which has been likened in the past to an academic sweatshop, but unfortunately it duplicates only the misery of the traditional sweatshop, not its efficiency, such as that was.

Another method, yet to be tried, endeavours to transplant the advantages of outward academic mobility into the institution itself. Essentially this involves retaining the basic academic rank of lecturer as a tenured position while making all other grades leading from the lectureship subject to a periodic review.

Initial promotion would continue to depend upon the same criteria as now, but promotion would no longer be for life. Instead any position above that of lecturer would be granted for a limited term only, at least in the first instance.

The position would automatically fall vacant again after five or seven years and would again be thrown open to competition. The academic who had held it would have the option of competing for a second term and, if successful, would become eligible to compete for a higher grade, also of a limited term initially.

If unsuccessful, or if he chose not to compete, he would return to that point on the lecturers' scale which he would have reached by then had he not been promoted. An additional incentive could be provided by making the promotion permanent at the end of the second or third term.

A system of this type could allow recognition to be spread more widely within an institution than is possible at present, and it could go a long way towards assuaging the bitter feelings that are bound to arise in any organization where there is little prospect of growth, and promotion for many becomes virtually a matter of "dead man's shoes".

It could also provide a greater number of incentives than the present inflexible system at no extra cost. Indeed, there could well be a hidden saving in the matter of superannuation costs as regular competition tended to favour the younger and more active faculty and fewer academics inclined to grades above that of lecturer.

Finally, the principles of the system are not unfamiliar to those in tertiary institutions. Limited term promotions may sound dangerously radical, but the concept of a limited term itself is well established in the context of administrative academic jobs, such as deanships or the chairmanship of departments. And few of us can imagine research finance which is not granted for a limited term and without the stimulus of regular competition.

John Whitehorne

The author is lecturer in classics and ancient history at the University of Queensland, Australia.

End of the liberal myth?

The current criticism of higher education suggests that this old argument—central though it has been to much academic thinking—is played out. A crucial assumption of the argument is that the ethos of the higher education harmonizes with that of industry.

A survey of student attitudes (*THES*, February 11) has now indicated that this is not so. Perhaps it never was: Sheldon Rothblatt and Michael Sanderson have documented mutual suspicion between business and the universities in the late Victorian period, and between the two World Wars.

Charles Wilson has shown that, over the nineteenth century, only half of the students who entered higher education from a business background subsequently returned to it; more generally, the clash between the values of culture and commerce, reflecting social class divisions, is a familiar theme of modern social history.

This further undermines the old liberal education theory. There is only one problem: a great deal of present higher education is based upon it. If it has come to the end of the road, we are left with much thinking to do.

Duncan Nimmo

The author is a member of the department of educational research at Lancaster University.

NORTH AMERICAN NEWS

MICHAEL BINYON reports from Washington

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Help needed to give more PhDs to minorities

America's top research universities are urging the Government to do more to encourage minority students to go on to graduate work. A plan for a series of federally funded fellowships for minority students is now being discussed with the Department of Health, Education and Welfare, and the universities are confident it will be favourably received.

The plan has been developed by the Association of American Universities, which represents the leading research institutions in this country.

It proposes two things: money to help universities recruit minority students more effectively by sending lecturers out to schools and setting up special units to deal with minority students' problems; and money for graduate fellowships to be awarded by universities to qualified minority students.

The aim is to increase the proportion of Blacks, Chicanos (Mexican Americans) and American Indians who enrol in PhD programmes. At the moment the proportion is very small. Among Blacks, postgraduate work is disproportionately concentrated in schools of education, and the numbers receiving doctorates in law, medicine, the physical sciences and other major fields is low.

Universities are constantly urged by the government to train more minority students in professional fields, and the programmes of "affirmative action" — special efforts to employ minority teachers in universities—depends on the existence of a pool of properly qualified minority PhD-holders in all disciplines.

The plan is in essence very simple, but it raises a number of difficulties. The most important is whether it would be legal. If fellowships were tenable only by designated minority groups, this would raise the question of reverse discrimination, and unfairness to other minority groups such as Jews and Orientals (though these are both well represented in PhD programmes).

This is a particularly important issue at the moment as the Supreme Court is to rule later this year on whether special minority admission programmes at universities constitute reverse discrimination and are legal.

The other difficulty is how such a programme should be administered. The Association of American Universities wants the grants to be paid competitively to those universities which show they have the experience, resources and commitment to increasing the number of minority PhDs. It would be up to each institution to select recipients for the grants.

The alternative is to set up national merit fellowship programmes, in which minority students compete for fellowships awarded directly by the federal government or its agencies, such as the National Science Foundation and the National Endowment for the Humanities.

The disadvantage of this is that it is of more symbolic than practical value. The best minority students are in high demand anyway at graduate schools, and there is no shortage of funds at universities to ensure that they are able to take up offers.

Black universities and organizations are worried that the government might opt for a scheme of this kind instead of the other which would be of more help in recruiting more good—though not necessarily the best—minority students.

No firm amounts have been proposed. A spokesman for the association thought any programme would need between $5m and $20m before the exact appropriation would have to be voted by Congress.

A similar proposal has just been made by the graduate deans council of 12 major Midwest universities which make up the Committee on Institutional Cooperation.

In a recent statement they said: "It is our considered judgment that a competitive institutional grants programme for the purposes of providing student assistance and other support services should be the primary avenue for federal support to increase minority participation in graduate education.

"We recognize that the environment at some institutions is conducive to the minority student's success and at other institutions it is not. Federal support targeted to those institutions with a positive track record in the recruitment and retention of minorities would exemplify strong national leadership.

"Obviously such institutional grants would make it possible to evaluate the extent of an institution's commitment to affirmative action with respect to academic, financial and support services to minorities."

A touch of charisma in Grosvenor Square

When Dr Kingman Brewster moves to Grosvenor Square as United States Ambassador to Britain, Yale University will lose a president who for some years has been one of the most forceful and successful in America. He is virtually the only major university president to have survived the turbulence of the student revolt in the 1960s.

At Yale he has been a charismatic figure since he assumed office in 1963. An international lawyer by training, he is outspoken, blunt and pragmatic. He faced difficulties head on and, unlike many university presidents who were overwhelmed by the social and racial crisis on campus, Dr Brewster was very visible and active in meeting the wishes themselves admirable.

His designation as ambassador to London seems at first sight surprising, but Dr Brewster is a friend of Cyrus Vance, the Secretary of State, who is still an active trustee of Yale.

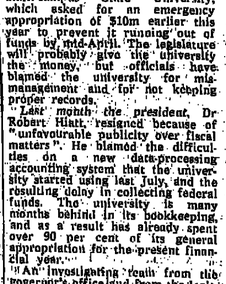
He also came to know the president when Mr Carter, right at the start of his campaign, spent a day as a Chubb visiting fellow at Yale (as Mr Ford has just done). The two have maintained intermittent contact for the past two years and month Dr Brewster led a delegation of six university presidents to the White House to discuss reform of higher education.

Dr Brewster spent a sabbatical semester in London in 1971; he has gave an important speech to the English Speaking Union in Edinburgh relations between Britain and the United States.

He served, at an early age, as Paris office of the Marshall Plan after the war. His particular academic interest has been international business law, especially Europe: a relevant study at a time of the present government's attempt to outlaw the payments of overseas by United States companies.

He has also been active in the United Nations associations, and now with Cyrus Vance was a member of the influential Council on Foreign Relations.

No date has yet been fixed for his departure for London: he has first to go through strict Senate procedures and confirmation by the Senate. Yale will have a difficult job to find a successor: there are no obvious frontrunners yet for what must still be one of the most influential and lucrative academic appointments in America.



Dr Brewster—from Yale to the Court of St James

Fraud scandal in Alaska

Higher education in Alaska is in turmoil, the State University has a multi-million dollar cash deficit, the president has resigned and a state investigating committee is now trying to find out how the money was spent.

The only private university in the state has just decided, after being closed for a year, that it will reopen in the autumn; and a native university in the far north has been accused of widespread fraud by claiming state funds for fictitious students.

The native Alaskan institution, Inupiat University, based at Barrow, is the most northerly university in the world. It is also one of the most remote. Last year it claimed to have 250 students, based in Eskimo villages on the north coast, who were supposedly taught in special classes held in villages. But an investigation by the Alaska Commission on Post-Secondary Education found that most of these classes were never held, and could verify expenditure of only $29,000 out of the $133,000 Inupiat received in state funds.

Charges of fraud were to have been investigated by a grand jury, but this has not yet met. Meanwhile no classes have been held at Inupiat this year, and an academic contract with Sheldon Jackson College in Sitka, nearly 1,000 miles to the south, has been cancelled.

State officials are also investigating the affairs of the powerful multi-campus State University, which asked for an emergency appropriation of $10m earlier this year to prevent it running out of funds by mid-April. The legislature will probably give the university the money, but officials have blamed the university for mismanagement and for not keeping proper records.

Last month the president, Dr Robert Hiatt, resigned because of "unfavourable publicity over fiscal matters". He blamed the difficulties on a new data-processing accounting system that the university started using last July, and the resulting delay in collecting federal funds. The university is many months behind in its bookkeeping, and as a result has already spent over 90 per cent of its general appropriation for the present financial year.

"An investigating team from the governor's office and from the legislature is now conducting a special audit, and the university's board of regents said it would engage management consultants to try to solve the difficulties.

The State University has now appointed an interim president, Dr Charles Ferguson, chancellor of the Juneau campus. The legislature has made it clear there will have to be a freeze now on any extra money for new academic programmes, and Dr Ferguson has indicated the university will agree to this.

Meanwhile an institution that has been on the edge of crisis for several years, the Alaska Methodist University, has decided that it will reopen after all this coming autumn. The campus in Anchorage has been in deep financial difficulties for several years. It is the only private university in Alaska, and has been suffering in the competition for students in the vast but underpopulated state with the fast-growing State University (THES, July 23, 1976).

Last year it dismissed its teachers, transferred its college of nursing to the neighbouring campus of the State University, and set up a special committee to see whether there was still a place for private education in Alaska.

The university came into conflict with its parent body, the Methodist Church, because the church's board of higher education was unwilling to invest any more money in the institution, and was upset that the trustees turned down an offer by the state to buy the 300-acre campus for $15.5m.

Last summer a special consultative team went to Anchorage to see whether there was a future for private higher education in Alaska and whether it was financially possible.

It identified four areas of need, which will form the basis of what the university offers in the autumn. They are: a master of liberal arts course to be offered in short intensive evening sessions; business administration, with emphasis on accounting, a teacher training course in psychology, and a basic liberal arts course.

The university hopes for an enrolment of 250 students, and would be viable with only a few less. It has already dismissed all its teachers, many of whom have now got other jobs, and so will be recruiting more. It aims to be self-supporting financially, without state or federal funds, and with only a little support from the Methodist Church.

Move to limit recombinant DNA research

One week after the end of a forum on genetic research, the government has decided to seek legislation to limit recombinant DNA research.

A report has just been issued by the Federal Interagency Committee set up to investigate the dangers, and this recommends legislating the use and production of recombinant DNA molecules.

The secretary of the department of health, Mr Joseph Califano, is releasing the report: "I recognize that legislation in this area would represent an unusual limitation of activities affecting science. But the potential hazards posed by recombinant DNA techniques warrant such a step at this time."

He added: "I believe such measure is necessary not only to safeguard the public but also to assure the continuation of basic research in this vital scientific area."

Last year, the National Institutes of Health issued guidelines aimed at regulating any recombinant DNA research funded by the Federal government. Till now these have only applied to private industry's research not sponsored by the government.

About the only point of agreement at the recent National Academy of Sciences' forum was that the guidelines should be universally observed.

Mr Califano said he is also urging research in this field not to be halted. He was "ensuring that we should proceed under carefully drawn guards unless and until there is a better understanding of the risks and benefits posed by the creation of recombinant DNA techniques".

Out Government regulations.

The federal committee's legislation should require any person engaging in such research to be licensed only at a facility licensed for the purpose. Legislation is now being drafted in consultation with the National Institutes of Health.

Dissident for California

Dr Mikhail Shtern, the Soviet endocrinologist released from a labour camp last week, has been invited to lecture in California. The invitation by the Universities of Stanford and California at San Francisco was issued while he was still serving an eight-year sentence, and this may well have been instrumental in obtaining his release.

Dr Shtern was head of the polyclinic Department of the Vinnitsa provincial endocrinology dispensary until 1974, and made a reputation for treating sexual underdevelopment with hormones. He was arrested after his two sons applied to emigrate to Israel, and was charged with taking bribes from patients and relatives, and selling medication.

A vigorous campaign for his release was organized by scientists and academics in the United States. In January, 90 prominent scientists and Nobel Prize winners signed an advertisement appealing for his release, and last year the Endocrine Society issued a resolution saying his continued imprisonment obstructed future scientific cooperation.

The invitation to lecture in California on his work was issued from Stanford by Dr Arthur Kornberg, a Nobel laureate in medicine and professor of biochemistry, and from the University of California medical centre in San Francisco by Dr Daniel Federman, chairman of the department of medicine.

News of Dr Shtern's release, ostensibly for health reasons and other humanitarian grounds, was publicly released by Tass, the official Soviet news agency, a very unusual move. It is therefore very likely that he will now be allowed to leave the Soviet Union and take up the invitations to Stanford and San Francisco Universities.

Italy

Was killing of student deliberate?

from Patricia Clough

BOLOGNA

Bologna University, the oldest in Italy, has for the past two weeks been the theatre for a drama of major political importance to the country.

In the view of many students and of the city's Communist administrators, student frustration has been exploited in a deliberate attempt to discredit the Communists in their strongest area and to undermine democracy in Italy.

The shooting of a student, the subsequent violence and the police occupation of the university has been a great shock in one of the most tranquil and well-run cities in Italy. Student rebellion in Bologna has been milder than, for example, in Rome and Milan and the crime and violence occurring in many parts of Italy are less serious here.

The peace was shattered on March 11 when police were unexpectedly called in—a grave and exceptional move for Italian university authorities—to deal with incidents between left-wing students and colleagues from a Catholic student organization, Comunione e Liberazione, which the former regard as an offshoot of the detested Christian Democrat ruling party.

Police charged and in the ensuing fray a final-year medical student, Francesco Lurusso, was shot dead. Alleged eyewitnessos claim that police aimed deliberately at the student. A number of bullet holes in the wall nearby indicate that they aimed at body height and not into the air.

The narrow, colonnaded streets of the medieval university district soon became the scene of violence and destruction as students rioted in anger at the death of their colleague.

Small guerrilla groups started smashing and setting fire to shops, breaking windows and smashing cars, a gun shop was raided for weapons.

Two days later, police and *carabinieri* with armoured personnel carriers moved into the university precincts and cordoned them off but skirmishes continued. Meanwhile, the bitterness had spread to Rome where a nationwide demonstration of some 50-000 students turned into guerrilla warfare with shooting and more destruction.

On Wednesday, March 16, the city authorities and political parties organized a mass demonstration of about 100,000 in the main square to condemn the violence and demand that full light be thrown on the shooting incident.

As the speeches blared out over the square, round the corner some 4,000 students squatted in the street chanting slogans, clapping rhythmically and raising clenched fists.

The students were particularly upset that the dead student's brother, Giovanni Lorusso, had not been allowed to speak at the big demonstration. Mayor Renato Zangheri said later that it was largely because he did not want to condemn the violence, but it was also suspected that bitter attacks on the Christian Democrats in his speech would have been unacceptable to the Christian Democrat leaders on the platform.

In a sense the Communists had had to make a choice between the Christian Democrats and the student left-wing. The choice further embittered the students.

The students were demanding the withdrawal of the police from the university precincts and the reopening of the university, the release of some 100 students who had been arrested and the reopening of two small radio stations which had been closed down on the grounds that they incited and directed the insurrection.

They also wanted the dismissal of the city's police chief and prefect.

To a person they were convinced that the shooting had been a deliberate act to provoke disorder and weaken democracy in Italy. They regarded it as significant that it had happened in Bologna, for 30 years solidly Communist.

There was strong disillusionment at the Communist Party support of the Christian Democrats, regarded as corrupt, and its failure to support their cause. "The Communists have prostituted themselves," said one girl student. "They have lost the leadership of the student movement."

The shooting, it was agreed, was a *spark which set fire to a highly combustible situation* caused by the great difficulties with which Italian students have to cope.

Reasonably priced lodgings are difficult to find, while there are 11,000 uninhabited rooms in the city to rent at inaccessible rates.

The student refectories are inadequate and students often have to queue for an hour and a half for a meal because they cannot afford to eat elsewhere. Above all, there is the ever present problem of graduate unemployment and the dismally low chance of getting jobs on a level with their degrees.

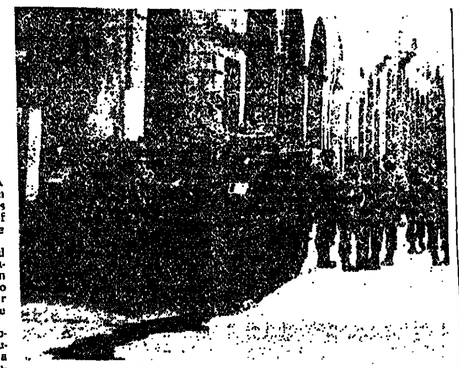
The demonstrating students were only a minority—the most active minority—of Bologna's 60,000 students and clearly others had more moderate views.

On the other side of the fence, however, the Communists and Socialist city fathers were equally convinced that the shooting and violence had not happened by accident.

Signor Zangheri listed a whole series of elements which he said indicated that it had been prearranged. The violence, he believed, "*was financed and guided by power centres in Italy and abroad*".

Bologna, he thought, was chosen because it was the traditional stronghold of the Communists so as to unnerve them and make them react violently.

"It was a trap", he said. "But we did not fall into it. The demonstration against the violence was the biggest there has ever been in Bologna. *It was a great success.*"



Unaccustomed traffic on the streets of Bologna

Holland

When a degree is a handicap

from Lynn George

AMSTERDAM

A 34-year-old unemployed sociologist working as a shikworker at one of Holland's largest electronics companies was dismissed recently for failing to admit on his application form that he had been to university.

Although an extreme case, it is none the less true that it is becoming increasingly difficult for the generation of graduates to find suitable jobs, with the resulting trend that some of them are accepting work below their academic level.

For a young academic emerging from the somewhat cloistral enclaves of a Dutch university with an eight-year, highly specialized study behind him, it does not hit particularly hard to discover that he no longer has an automatic right to a well-paid position in society.

Until the beginning of the 1970s, graduates were placed on the labour market with relatively few problems. Since then the number of suitable jobs has not kept pace with the sharp growth in available graduate manpower. Not that the former is considered desirable.

According to Dr Jos van Kemenade, Education Minister, if the labour market—initially responsible for the upsurge in highly qualified personnel—were to meet the current demand for jobs it would lead to a situation of "overproduction".

The present surplus of young graduates is directly attributable to the spectacular expansion of university education in the 1960s. This was marked by an increase in new courses, the founding of new institutes, an escalation in funds and—because of the population explosion after the Second World War—a stepping up of student numbers.

In 1925 for example, there were only 26,000 university students but by the mid-1960s the total had risen to 64,000.

Since then, the university student population has increased annually by 10 per cent. Similarly, the number of students successfully graduating has also shown a dramatic increase.

In 1955, the figure was 3,133. In 1965 it had risen only slightly to 3,707 but a decade later it was up to 9,913 (official figures from the government's Central Bureau of Statistics).

According to the Bureau Arbeidsvoorziening Academici, a general clearing house for unemployed graduates run by the Ministry of Social Affairs, there are now 3,600 graduates unemployed. This is, slightly lower than the 1975 figure of 3,700 and represents 4 per cent of all academics.

Mr Van Esbroeck, director of the bureau, predicts that the percentage will catch up with the 5.2 per cent total unemployed figure. Those in the technical sciences comprise the largest group of unemployed (620 without jobs) followed by the social sciences (439), lawyers (408), natural sciences (326) and psychologists (321). (The order remains unchanged from last year.)

The future outlook for graduates appears even gloomier. According to a 1975 government document, "*Development Trends for the Supply and Demand of Academics until 1990*" compiled by the Ministry of Education and the Central Bureau of Statistics, the number of academics on the labour market is expected to grow from 160,000 in 1980 to about 300,000 in 1990.

If one takes present university policy, average trends in study choice and work expectations of academics measured by salary and position, then by 1990 the report predicts 40 per cent of the group will be looking for jobs.

Unemployed graduates, like any unemployed, who have already had jobs are entitled to 80 per cent of their earnings for six months and after that 75 per cent for a further two years. They then come under the *National Assistance Act whereby* payment varies according to individual circumstance.

Graduates seeking their first job draw national assistance benefits. Some young graduates after months of unsuccessfully applying for jobs are prepared to take unpaid work in their field in order to gain the necessary experience many positions require.

Although no figures are available, Mr Van Esbroeck has the impression that the trend is towards graduates taking jobs normally reserved for those with higher vocational diplomas.

They in their turn are taking the jobs from higher secondary school leavers, and so on down the scale.

Denmark

Quota system will stabilize admissions

from Mike Duckenfield

COPENHAGEN

A quota system with between 20 per cent and 70 per cent of first-year places reserved for those applying with work experience is to be introduced in Denmark this autumn.

Proposals presented by the Government to the Folketing's education committee also include a 2.2 per cent increase in admission to long-term full degree courses during the next academic year and the stabilization of admissions at 20,000 until 1980.

The new selection procedures and course intake limit follow work by five Government-appointed faculty committees made up of senior academics and the decision last June to restrict entry to all long-term studies.

It has been considered necessary to halt the massive and largely unplanned expansion of higher education during the past 16 years. This expansion has seen the proportion of 19-year-olds qualifying for higher studies increase to nearly three in 10, while university dropouts from degree studies taking between five and seven years have been estimated by the education ministry as high as 70 per cent in humanities and 50 per cent in social sciences.

At the same time innovations, such as the creation of university centres offering short-term courses at Roskilde and Aalborg, have had little overall effect on higher education. Only about 1,000 of last year's 19,700 first-year enrolments were at the two centres. Restricted entry to medicine faculties was introduced on a trial basis last year with admissions cut drastically from 1,400 to 850.

The quota system used is now to be applied for all faculties except teacher training and psychology. There will be three quotas: one for those applying directly on the basis of school-leaving marks from upper secondary institutions including the academic gymnasium and commercial schools; another for those applying with both marks and work experience; and a third for those without appropriate school marks but with foreign or special qualifications including mature students, 25 or older.

Except for entry to the technology faculties, work experience will be able to be gained in any job with points being awarded for a minimum nine months to a maximum 18 months' work.

Points gained will be multiplied by the applicant's average leaving mark on the schools one-to-13 grade scale. For nine months' work, points worth 1.09 will be given, rising by 0.01 for every additional month's work to 1.18 for the maximum. An applicant with a mark of 7.4 and 15 months' work would thus score 8.51 points.

Work experience will mainly help those who fail to get good enough marks to apply directly to university in the first quota.

The 70-20-10 ratio between quotas for the natural sciences and veterinary medicine, for example, stresses direct entry more than the 60-20-20 ratio for humanities and social science. While the 50-40-10 ratio for medicine and dentistry puts more weight on work experience.

For admission to the technology faculties, work experience must be judged relevant to future studies and have covered 18 months.

Unlike the other faculties, teacher training and psychology will adopt a purely points system for entry. *Four-fifths of places will be allocated in this way with the remainder, like for the third quota at the other faculties, being reserved for individual assessment.*

Those with nine months' general work experience will get an extra point and those with 15 months or more two points. These will be doubled if the experience is judged relevant to future studies.

There are to be no limits on the intake of foreign students except for medicine, dentistry, pharmacy and agriculture. Future admissions to each course and institution are to be decided annually by Parliament and the Government has made projection of manpower needs in the professions up to 1980 and 1990.

These show that there is likely to be a 5.8 per cent annual growth in the need for professionally qualified workers in the years up to 1980 but only a 3.8 per cent annual growth in the following decade.

The greatest need will be for social workers and social services employees (up 243 per cent by 1990), psychologists (160 per cent), economists (109 per cent) and architects (103 per cent).

On the other hand, demand for doctors (77 per cent), engineers (58 per cent), comprehensive school teachers (55 per cent), dentists and lawyers (51 per cent), surveyors (45 per cent) and journalists (35 per cent) will be low.

Though overall admissions on full degree courses will increase 2.2 per cent to 19,720 this autumn, intake at both the traditional universities will be cut drastically: at Copenhagen by 15.4 per cent and at Arhus by 16.6 per cent.

However, both these figures are well below the preliminary ones of 25 per cent planned last year (THES, August 13, 1976). As a consequence, there will be considerable growth at newer institutions. Odense, the much favoured technocratic university founded in 1956, will have its intake increased 44 per cent, the newest of the two university centres, at Aarlborg, will get 75 per cent more first-year students and intake at other higher institutions will rise 11.1 per cent.

Republic of Ireland

Link-up goes ahead for two biggest medical schools

from John Horgan

DUBLIN

Plans for giving one of the Irish Republic's oldest independent medical schools a new status as a recognized college of one of the Dublin universities are close to endorsement this week.

The medical faculty in University College, Dublin, will be considering proposals from the Royal College of Surgeons in Ireland for recognition of its courses and its teachers. The RCSI request, originally made by them to the UCD authorities, was first of all referred by UCD to the senate of the National University of Ireland, and has now gone from the senate down to the medical faculty.

It will return to the NUI senate, where a final decision will be made, via the UCD academic council and governing body, each of which will consider the medical faculty report in turn.

The new move would link the two largest of the Republic's five medical schools—after UCD, RCSI is the next biggest—in a move directly related to the recent series of government decisions that the award of degrees should be confined to the universities.

Forging links between medical schools in Dublin has been fraught with difficulty. The whole discussion of rationalization of university facilities has been. UCD and Trinity College, for example, was for a time bedevilled by the problems of medical education, and many of the most important details still remain to be worked out.

The proposed arrangement between UCD and RCSI has, however, a rather special character, derived largely from the anomalous position of the RCSI in the Irish higher education system.

For one thing it is—apart from the cost of the teaching beds it uses in two Dublin hospitals—almost wholly self-financing. It has some 700 students, but its grant from the Department of Education in the current year is only £18,000—a figure which has remained unaltered for eight years.

It charges fees designed to cover the full cost of the education it provides and, partly as a result of this, has always had a high proportion of students from overseas. Indeed, the tendency has been for Irish government to diminish, and it is now no more than 20 per cent.

TIMES PAST — THE TIMES

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The condition of Oxford

Oxford is much more than a university: it is a social institution of great importance in the historical formation—and the present constitution—of the English nation. Through *Alice in Wonderland*, *Zuleika Dobson*, and *Brideshead Revisited* it can even claim to be embedded in our cultural consciousness. (page 6 and following).

It is taken for granted that a majority of any Cabinet has probably been educated there (and a good proportion of the remainder at Cambridge). No one is surprised to learn—although many may resent it—that Oxford graduates are equally well represented in our permanent government, the higher levels of the civil service. Oxford and Cambridge together are among those few institutions, like the House of Commons or the TUC, that help to define the uniqueness of our national experience.

Yet Oxford's external influence in our society does not mean that the university should be shielded from scrutiny of its internal operation as an institution of higher education. The two are intimately related. The conscious continuity of Oxford is remarkable. What other adjective can describe an institution founded in the Middle Ages that overcame the challenges of the Reformation, the scientific revolution, the Enlightenment, and the industrial revolution and still flourishes in 1977? Certainly it has worn better than its older sisters, the Sorbonne now unceremoniously chopped into 13 or so parts, and Bologna scarred by riots and under virtual martial law.

Yet the very antiquity of Oxford can lead to confusion. Its medieval origins may tempt its enemies to regard it as an almost antiquarian institution. In fact Oxford in its present form is very much a nineteenth-century creation. Following the defeat of clericalism the university was set on a new course by Jowett and others, to provide the *corps* of government for the emerging industrial and imperial state as much as to produce academic scholars. So it is not too misleading to regard modern Oxford as contemporary with the great civic universities of the North and Midlands.

But if the ends were similar, the means were very different. The civics were professorial universities in which the skeleton was provided by subject departments. The academic and the social aspects of a university education were largely separated. Oxford (and Cambridge) remained a collegiate university in which the individual colleges provided the backbone.

This helps to explain the apparent backwardness of the curriculum in many subjects at Oxford. It is said that most other universities have long ago abandoned Oxford's "survey" approach to history, or that PPE is a bad course. Many in Oxford would dispute the wisdom of the first and the truth of the second. But in any case Oxford's backwardness is more apparent than real. Other universities need the curriculum to provide their structure, directly in an academic and indirectly in a social sense. At Oxford this structure of academic and social life is provided by the colleges. The "public" curriculum expressed through formal School requirements is perhaps less important than the "private" curriculum provided by tutorial teaching in a college environment.

This may help to explain the standards by which Oxford should be judged. It is vain to place the university on an index of innovation along with Sussex or Kent (although the degree of curricular innovation in the last 10 years has been considerable). Oxford is an international centre of scholarship, particularly in the humanities. It is also a university that is very concerned to teach undergraduates well. If it is less involved in the "bit-in-between"—curricular innovation—it is because there is less need.

But this explanation is not meant to excuse the anomalies that still remain. There are the ancient scandals such as the status of All Souls (a problem with which the Franks commission was well acquainted) and the continuing disparity in wealth between colleges. There are structural problems, the ambivalent and unsatisfactory position of postgraduates and the dangers posed to Oxford's rather easy admissions system by changes in secondary schools. These are serious problems that should not be ignored but 800 years of tenacious continuity place them in their proper perspective.

Radicalism or responsibility?

Why are today's students so boring? The question is not addressed to students as individuals, but *en masse*; it is not concerned about the undoubted seriousness of the issues taken up by the student movement, but the way that they are taken up; and it is not asked in a sense of criticism (though many will probably take it as such), but of genuine curiosity.

Student politics has traditionally operated at two levels. At one level, it articulates the political demands of the student body itself; but it also performs a parallel function in symbolizing demands and grievances of a broader social nature. The idealistic revolutionaries of 1968, for example, in their attacks on the academic establishment, expressed a more general dissatisfaction with the superficial consumer-society glamour of the 1960s.

It was a common complaint of the time that students should become more reasonable—and hence more realistic—in both their demands and their tactics.

To a large extent this has happened but to many observers, the baby of youthful idealism has been thrown out with the bathwater of "irresponsibility". Debates within the student movement are concerned primarily with means rather than ends. The utopian visions of past student leaders threaten to be swallowed by the bureaucratic efficiency of the administrators of today.

Before student leaders throughout the country leap to their pens in self-defence, it must be reemphasized that this is not a criticism. The political and economic climate is different from that of 1968. The type of concerns which trouble students—as the costs of education rise and the value of the student grant declines—are not those which concerned their relatively wealthy predecessors.

The spectre of the dole queue offers a very different future from the well-paid job which was thought to await every graduate. Students and their leaders are not to be blamed for turning from idealistic demands for the restructuring of society towards those of a more pragmatic and utilitarian nature.

Of concern, however, as Professor Ralf Dahrendorf suggested in *The THES* two weeks ago (March 11) is the present style of student debate. It is, he argued, now essentially protectionist rather than expansionist, materialist rather than idealist, defensive of the establishment rather than critical of tradition.

The reason for this situation is not, as some have argued, that students have become more "establishment-minded" in a conservative sense. It is more a reflection on the fact that, just as the social importance of education has slipped down the agenda of political priorities, so the political importance of the student movement has become increasingly marginal.

The situation must be accepted, not lamented. But it would be a tragedy if student politics were as a result to slip from the sharp dialogue of ideological debate into verbose mediocrity. Any society needs its myths and heroes, if only to keep its culture alive.

LETTERS TO THE EDITOR

Demand for engineers

Sir,—The dean of engineering at Hatfield Polytechnic (*THES*, March 18) provides further evidence that, as Professor Blaug has argued, we should regard expressions of "need" in manpower literature with the suspicion usually accorded the emotive arguments of special interest groups. In this case "lecturers with empty places who are worried about their jobs".

As with all the panaceas to which British management has been addicted since the Second World War, your correspondent's piece of special pleading is characterized by that pot-pourri of unsubstantiated generalizations, contradictory assumptions and general lack of rigour which makes rational discussion difficult.

However, as my colleagues and I are called upon, from time to time, to contribute to courses intended to broaden the education of technical and engineering students, I feel obliged to make the attempt.

Your correspondent expresses the belief that "it would be quite impossible to overproduce well qualified and able engineers". Is this because there are insufficient resources to produce such a quantity —assuming "overproduction" to be quantifiable—or because any number of qualified and able engineers could find relevant employment at prevailing salary levels? Does Mr Gray have any evidence for these, or any other possible interpretation of his belief?

This particular expression of subjective belief is followed by others. We are informed that "it should be patently obvious that his (the engineering student's) chances of securing a job in his chosen profession are far higher than for his arts counterpart". Are we to understand that it is patently obvious that it ought to be the case that his chances are better, or that arts graduates are less restricted in their choice?

It is, apparently, equally obvious to Lord Crowther-Hunt (*THES*, May 21, 1976) that the majority of 18-year-olds select courses "largely on the basis of their relevance to particular types of career". Is there any evidence that students in humanities, arts and social sciences are choosing unwisely in terms of careers, and why, if they are, they should be continuing to do so?

Leaping—with no visible means of support—to his next premise, your correspondent assures us that from the point of view of return for investment "there is much to commend in backing technology courses". Are we being asked to consider social or private rates of return?

What evidence there is suggests that the social costs of educating a technology graduate are greater than an arts graduate, and as it is argued that engineers and technologists are low paid in comparison with non-engineering graduates, this assertion of beneficial rates of return requires scrutiny.

While the work which has been done on rates of return analysis suggests the fruitfulness of this line of enquiry, it has also demonstrated the crippling paucity of the necessary data. (Blaug 1970, Layard, Sargan *et al* 1971, Mace and Wilkinson 1973.) The last two works also question the existence of a shortage of engineers, as does the latest research of Professor Blaug (*THES*, March 4), while Layard and Sargan suggest higher private rates of return to lower cost, part-time courses. In the context of a discussion largely based on crude international comparisons, compulsory day release after minimum school leaving age as in Germany, should also be considered.

There is the hint of further contradiction in the air when we are informed that degree courses in engineering are often broadly based. I understand that Mr Gray's engineering colleagues at Hatfield consider attempts to initiate such courses to have been unsuccessful, while the assertion in the next paragraph that the engineering graduate will be no worse off than the unemployed arts graduate requires some clarification.

Unless the representatives of special interest groups inform themselves of the nature of the problem for which they advocate solutions, those solutions will, if implemented, create further problems. Until they are aware of the distinction between forecasts and projections; the problems and paucity of data faced by those attempting to measure shortages of skilled manpower; and the problems inherent in any attempt to link education and occupational categories, the debate will lack the rigour necessary for the solution of complex social and economic issues.

Yours faithfully,
RICHARD TURTON,
Principal lecturer in sociology,
Hatfield Polytechnic.

Sir,—Sir Derman Christopherson's report and the news item on Professor Blaug's research "Shortage of Engineers Myth Exploded" did not specify which types of engineer were currently or imminently to be in abundance. So the message is as convincing as announcing in the spring that fruit and vegetables will be abundant in the summer.

Indeed it is. Will the harvest be big enough is the more important question. As a healthy balanced diet needs an abundance of fruit and vegetables, so a healthy modern society needs its members educated not only to literate and numerate standards but also technological ones.

Modern society has a technological base which is growing. Society needs technological awareness; its citizens should possess the confidence born of familiarity with engineering and scientific concepts in coping with its problems. A far too small proportion of our society are so equipped.

The main well springs of educated "technicate" persons are the departments and school of engineering of the polytechnics and universities. Their output which goes to redress this imbalance in society is vital.

Undoubtedly the vagaries of manpower planning will always prevent the exact match between unfilled engineering posts and engineering graduates. But this should not be the only aim of engineering education any more than the aim of most history departments, say, should be only to satisfy the vacancy lists of archivists.

What frightens me is the ready acceptance that the technological education provision is only required in order to satisfy the vocational demands from time to time of (a restricted part of) society and is not seen as contributing in any way to the general education of society as a whole.

E. L. HOUGHTON,
Associate Dean,
School of Engineering,
Hatfield Polytechnic.

Poly part-timers

Sir,—I am astonished and dismayed by the report you carry (*THES*, March 4) of Mrs Williams' attack on polytechnics for their failure to develop adequate part-time courses.

This polytechnic offers a wide range of part-time courses, from City and Guilds technicians courses, through first degree courses, to a range of postgraduate certificates and diplomas. Almost without exception, our problem has been to recruit enough students to keep them going.

Indeed, at the last meeting of the faculty board of which I am a member, we received a paper from the director saying that four part-time courses would not be offered in the coming academic year due to lack of students. To put the problem another way, the vast majority of our part-time courses could double their numbers without embarrassing the polytechnic in terms of accommodation, staff and so forth.

Perhaps Mrs Williams would be performing a more positive task if she were to inquire why students do not present themselves. Whilst we think we know some of the answers (and Mr Len Murray touched on some of these) clearly we do not know all of them. In my own experience, lack of knowledge of employers' attitudes and expectations looms large.

Yours faithfully,
P. WOODCOCK,
Faculty of business studies and management,
Middlesex Polytechnic.

OU and mar

Sir,—Ernest Rudd's lucid [illegible] of who gets what fees [illegible] and why, among [illegible] students in higher educa[illegible] I shall keep for reference [illegible] March 18). There is [illegible] graph, however, to which [illegible] time tutors in the Open [illegible] would demur.

Mr Rudd, describing [illegible] of one of the three [illegible] specifically excluded from [illegible] awards, mentions the mana[illegible] student who has perhaps [illegible] a teacher, worked for a [illegible] out much job-satisfaction, [illegible] "tried, at times, in a [illegible] planned way, to train for [illegible] more to her liking, and [illegible] her late 30s or early 40s, [illegible] teenage children are also [illegible] after themselves, is at [illegible] she has always wanted [illegible] university experiencing [illegible] tual stimulation of a degree [illegible]

He goes on: "For [illegible] the second chance offered [illegible] Open University course [illegible] the question. It would [illegible] ing at hours when [illegible] are at their most demanding [illegible] many of them badly need [illegible] tunity to break out from [illegible] gent housewife's feeling of [illegible] tual isolation, and this [illegible] University does not offer."

In my experience, and [illegible] of most part-time students [illegible] those working in a city [illegible] is a conventional university [illegible] takes mature students, [illegible] women the second chance [illegible] by the Open University is [illegible] option in question: it means [illegible] ing at hours when their [illegible] are at school and their [illegible] at work. I should have thought [illegible] being a full-time student [illegible] (where the survey he reports [illegible] made) would conflict more [illegible] demands of domestic life [illegible] time Open University study.

Face-to-face tutorials [illegible] infrequent in the Open Uni[illegible] but not in the first year, [illegible] student may see his tutor [illegible] one evening each week; here [illegible] are old enough to prepare [illegible] for themselves once a week, [illegible] usually assist their perhaps [illegible] sufficient father.

The "feeling of intellectual [illegible] is something [illegible] the Open University has [illegible] all with more face-to-face [illegible] were possible, and more [illegible] of all kinds between students [illegible] in her foundation year the [illegible] well-organized, highly [illegible] Open University woman [illegible] does have at least the [illegible] chance to meet like-minded [illegible] to take part perhaps in a [illegible] group, and to begin forming [illegible] work of contacts with [illegible] fellow students.

Yours faithfully,
MERIVAN COLES,
Open University part-time [illegible]
Arts Faculty,
London Region Representative [illegible]
Part-time Staff Consultative [illegible]
Committee,
Courtfield Gardens,
London SW5.

External examiners

Sir,—Although the anomaly [illegible] ing from the Government's [illegible] called e-policy, in so far as [illegible] to university teachers is [illegible] known, attention should [illegible] also to the following matter [illegible] though it applies only to a [illegible]

Certain universities appoint [illegible] nal examiners on a three-[illegible] and this relates also to [illegible] involved. It is understood [illegible] work involved in extramural [illegible] done in the examiners' own [illegible] The three-year period of [illegible] inequitable arrangement to [illegible] bear in mind the rate of [illegible]

It is therefore with astonishment that I note that [illegible] institution such as UWIST [illegible] enously modifies its arrangements [illegible] take account of this [illegible] that the same could be said, [illegible] example, of UWIST which [illegible] seem to have heard of [illegible] of that institution will wish [illegible] haps prospective external [illegible] in mind.

Yours faithfully,
K. A. WEALE,
Director,
Department of visual science,
Institute of Ophthalmology,
London University.

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Technology and post-industrial society

by Philip Sadler

It is unfortunate that most of the discussion about the social consequences of technological innovation is concerned with the potential hazards of specific new technologies. Obvious examples are radiation, atmospheric pollution, side-effects of new drugs and the implications of computerized record systems for personal freedom.

This is not to deny that such hazards exist, nor to dispute the need to reduce them to socially acceptable levels. The point is, rather, that by focusing attention on these issues we are in danger of neglecting more fundamental matters to do with the way technological advance brings about change in the nature of human society.

The question most often posed is whether or not society is willing to accept certain costs, usually stated in terms of risks to health, safety, individual liberty or the quality of the environment, in exchange for certain benefits from new technology usually stated in economic terms.

The more important question is, given continued technological progress, what kind of society is likely to develop, and what will be the most difficult problems of adjustment as this development takes place?

We know, from the experience of the past 150 years and the working through of the industrial revolution in many countries, that technology brings about social change in various ways. Through improvements in productivity in agriculture and manufacturing it has played a major part in bringing into being the affluent society.

The labour-saving nature of much new technology has resulted in a substantial redeployment of manpower and consequential social upheaval on a grand scale. This has been most marked in the field of agricultural productivity, bringing about massive decline in agricultural employment in the advanced industrial societies. With the spread of automation, similar declines in employment opportunities are likely to occur in key sectors of manufacturing industry during the next 25 years.

New technologies also result in new systems of organization in the workplace, new relationships between men and systems of production, and requirements for new skills and abilities. At the same time they bring about the obsolescence of organizations, production systems and skills—things in which individual human beings and entire human communities have invested their futures.

Outside the sphere of work and industry, technology has made its impact on the social order in a variety of ways. Developments in transport and communications have increased mobility and greatly reduced the social distance between human communities. In the domestic field women have found freedom from much domestic drudgery and, in consequence, have come to expect much more from life than the kitchen sink.

In medicine improved medical care has contributed to the longevity of the population, while birth control improvements have not only produced demographic changes but have contributed to profound changes in the sexual mores. Many of these changes have brought human beings more leisure time and a wider range of leisure opportunities.

It can, of course, be argued that many of the social consequences of technological innovation have detracted from, rather than added to, the quality of life. The history of the industrial revolution is littered with examples including alienation from work and the destruction of community identity. The point is not, however, that technology produces social consequences of a desirable or undesirable nature, but that it produces social consequences which are far-reaching and profound, and about which we know far too little.

Many commentators who have studied these processes believe that their inescapable consequence will be a qualitative shift in the nature of human society—a shift from the kind of society we know as "industrialized" to a new type of society usually referred to as "post-industrial". The latter is envisaged as one in which the problems of the distribution of the wealth created by technology will take precedence over problems of wealth production—hence the alternative description—the "distributive" society.

The principal characteristics of such a society include an increasingly high proportion of Gross National Product accounted for by service sector activities. Among the consequences of this trend are —decline in employment opportunities in manufacturing and a related growth in employment opportunities in those service industries least likely to experience productivity changes as a consequence of technological change (e.g. education, medical care, social services, professional and scientific services); and increasing irrelevance of conventional measures of GNP and rates of economic growth due to problems in measuring service sector outputs and productivity changes. High rates of economic growth as conventionally measured are unlikely.

The "economically active" will constitute a smaller proportion of the total population. Although initially there may occur serious structural unemployment, in the longer term reduction in the labour supply will be achieved by means of improved opportunities for higher and continuing education, by earlier retirement and by work-sharing.

Per capita incomes will be high by current standards, but their impact on patterns of consumption will be moderated by a high level of provision of social benefits for those not in receipt of incomes from employment and by a more egalitarian incomes distribution. The pressure of high living standards on resources of energy and materials will be moderated by the tendency for high income groups to allocate discretionary spending more to the consumption of services than to increased consumption of goods.

Manufacturing industry will characteristically be highly automated. In consequence, the average size of an enterprise or production unit, as measured by numbers of employees, will fall significantly, giving rise to new forms of work organization. The ratio of direct to indirect workers will continue to decline. The key industries for international economic competitiveness will be those which are science- or knowledge-intensive, rather than labour- or capital-intensive.

Participative systems of management will develop in all forms of social organization alongside the devolution of powers and the decentralization of much decision-making.

There will be a move away from ownership of property towards systems providing for use and access rather than ownership (e.g. urban pools of mini-cars).

Society will be principally characterized by value systems reflecting concern for the quality of life and for the freedom and self-expression of the individual.

The influence of central and local government in economic and social affairs will continue to grow.

The achievement of sexual equality will be accompanied by erosion of the traditional social differences between male and female in terms of role and status.

The key institutions of such a society will be the knowledge-intensive institutions—the universities and other centres of higher education, and research and development organizations.

This vision of the future is, of course, highly debatable. It is, however, an illustration of the results of thinking through some of the consequences of continuing to apply technology to the improvement of productivity. Like most Utopian visions it sidesteps the critically important issue of how, given the present condition of industrialized societies in general and the United Kingdom in particular—the transition is to be brought about. Jacques Ellul, in *The Technological Society* (Jonathan Cape) says, "A question no one ever asks when confronted with the scientific wonders of the future concerns the interim period. Consider, for example, the problems of automation, which will become acute in a very short time. How, socially, politically, morally and humanly, shall we continue to get there? How are the prodigious problems, for example, of unemployment, to be solved? . . .

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"When we reflect on the serious, although relatively minor, problems that were provoked by the industrial exploitation of coal and electricity, when we reflect that after 150 years these problems are still not satisfactorily resolved, we are entitled to ask whether there are any solutions to the infinitely more complex hows of the next 40 years."

The problems involved in adjusting our social institutions to technological and economic change are indeed formidable. Among the tasks we face in the next decade or so are the following:

- Adjustment of the educational system to the requirements of new jobs and a new balance between work and leisure.
- Development of new criteria for measurement of national progress towards "quality of life" objectives.
- Development of improved systems for the management and control of public sector organizations and other institutions in the non profit-making field, including educational organizations.
- Identification of adequate means of motivating people to contribute towards societal objectives, given the weakening of traditional incentives.
- Development of politically acceptable means of transferring incomes from producers to non-producers, and from affluent to less affluent regions.
- The working out of a new system of international trade, particularly in relation to the developing countries, based on recognition of the absolute requirement to export technology and employment rather than manufactures.
- Creation of participative managing systems that actually combine effective management with participation.
- Above all these is the problem of changing attitudes, particularly in Britain.

If we are to develop adaptive social institutions so as to respond to rapid technological and economic change and avoid catastrophic breakdowns of the social order, we must learn how to improve our skills in the fields of planning and social engineering. This will not be easy; if we are to succeed, three conditions must be met.

First, the identification and analysis of the social consequences of technological change must proceed dispassionately, objectively, and as scientifically as possible. Certainly, it must be freed from undue pressure from political sources or from vested interests or pressure groups of various kinds. There exists an urgent need for the creation of independent institutions of research capable of withstanding such pressures.

Second—and this would constitute a major task for such research institutes—there is a requirement for better models to work with.

Third, there needs to be an improvement in the way we approach the actual processes of managing change and conflict. Most attempts to bring about significant change in social institutions give rise to conflict. This reflects the virtually inevitable reactions of defensiveness and resistance to change of those who perceive change—rightly or not—as a threat to existing rights or privileges.

The constructive resolution of such conflict calls for skills of the highest order, yet the development of such skills is generally neglected. In particular, the almost universal absence of any training in the management of change as part of the formal education of technologists is worrying.

Finally, it is apparent that if these conditions are to be met there must occur in the future a closer integration between the disciplines of technology, economics and sociology than has been the practice in the past. This integration should begin at undergraduate level and continue into postgraduate and continuing education programmes. It needs to be recognized in the establishment of explicitly interdisciplinary research institutions.

It can be argued that it is in the longer term interests of institutions in higher education, acting together with industry and government to foster and support the creation of inter-disciplinary programmes of research concerned with the dynamic interaction of technological and economic progress with social factors. Already there is considerable support for such single-discipline studies as economic and technological forecasting. The time is now ripe to add a comparable level of effort in social forecasting and to integrate the three into what, after all, has always constituted "the proper study of mankind".

The author is principal of Ashridge Management College, Berkhamsted.

Plants that make our society possible

by Ralph Riley

Crop plants provide most of the food used by man and his domestic animals and much of the fibre, rubber and pharmaceuticals. Without these plants the development and expansion, in size and complexity, of human societies would not have been possible. Yet the essential botanical underpinning of our societies is remarkably narrow.

Apart from decoratives only about 500 plant species are cultivated, and the great bulk of the plant resources upon which we rely is provided by some three dozen or so species—the names of many of which will readily come to mind especially if you are reading this at the breakfast table or over your after-lunch coffee.

However, the mere cataloguing of the crop species currently used may give an unrealistic impression of fixity and continuity. The range of crops principally used in the 1970s does not correspond to that of the past and the future may well see further changes—depending upon the products required and the insight and inventiveness of crop scientists.

This is not to suggest that there will be substitutions for the major crops, such as rice, wheat, maize, sorghum, millet—on which civilizations have been built—nevertheless changes may be expected.

The introduction of new crops into agriculture and the disappearance of others is the backcloth of history. For example, about 10,000 years ago the first agriculturalists of the Fertile Crescent of Mesopotamia made use of, and domesticated, primitive wheat species. The bread wheat species which is a dominant crop in current world agriculture probably arose in cultivation some 1,500 or so years later.

For some period afterwards the bread wheat species was cultivated together with its primitive relatives but subsequently, because of its greater productivity and usefulness, it largely replaced them. In addition, its better adaptation to extreme conditions permitted the expansion of agriculture into many continental and sub-tropical regions as well as into the temperate zones.

So the primitive species of wheat are no longer economically significant, but they have not been entirely abandoned from cultivation, as have other former crops. The common British weed Fat Hen (*Chenopodium album*) was formerly a crop. Analysis of the well preserved stomach contents of three Iron Age men—buried in a ritual manner in Danish peat bogs—has revealed that their last meals probably consisted of a gruel in which the seeds of Fat Hen figured prominently together with those of flax and barley.

In Europe Fat Hen has for long ceased to be a crop but quinua (*Chenopodium quinoa*)—a species in the same genus as Fat Hen—is still a staple grain in the highlands of Bolivia, Chile, Equador and Peru, as it was for the ancient Incas. Little plant breeding work has been carried out on quinua but it is a crop which, following research imputs to improve yield and seed quality, might extend its geographical range since it has the advantage of high protein content.

About 30 per cent of the rubber used in the world derives from the rubber tree (*Hevea brasiliensis*) while the rest comes from the petrochemical industry. The economies of Malaysia, Indonesia, Thailand and Sri Lanka are critically dependent on *Hevea* rubber but until the beginning of the twentieth century the crop did not exist.

In 1876 the plant explorer H. A. Wickham sent seeds of rubber to the Royal Botanic Gardens at Kew where rather less than 3,000 seedlings were raised and sent principally to Sri Lanka but also to Malaysia and elsewhere. The natural rubber industry of the world is still based very largely on the descendants of these first introductions to agriculture.

A new and important crop became established in response to an industrial need and the perception by botanists and agriculturalists of how the need could be satisfied. Fortunately ecologically suitable land and the labour to work it was available.

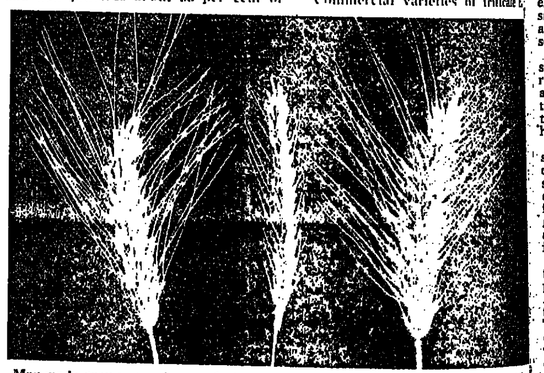
But consideration of rubber cannot end there. Most rubber now used consists of synthetic elastomers, but the petroleum from which it is made is an increasingly costly resource and moreover a resource that is not renewable. So rubber, a crop of the twentieth century, may well increase in importance and may indeed need to be supplemented.

The harvest of natural rubber could be increased by renewed interest in guayule (*Parthenium argentatum-Compositae*) a long-lived shrub of the dry areas of North Mexico and South Western USA. It was cultivated for rubber production in the USA in the 1910s when there were no supplies of South East Asian *Hevea* rubber. The whole plant is harvested and about 20 per cent of its dry matter is rubber.

The only guayule now used is from natural stands in Mexico but with changing economic conditions, and improved processing methods and agricultural technology, it could become a significant crop of the future. Certainly it is reassuring to be able to contemplate renewable stockpiles of rubber being available from such highly contrasted ecological regions as the humid and semi-arid tropics.

Sugar did not become available in Europe until bulk trade opened with South and South East Asia. Before then sweetening had largely depended on honey. The large scale use of sugar awaited the colonization of the Americas and the establishment of sugar cane (*Saccharum officinalis*) plantations in the Caribbean.

Sugar beet (*Beta vulgaris*) is the alternative crop to cane for sugar production and now provides about 35 per cent of



Man-made crop: cereal ears of (left to right) macaroni wheat, rye, and triticale

the world's supply. Until 1801, however, when the first beet-processing factory was established at Kunern in Silesia, *Beta vulgaris* was used only for cattle fodder or, as beetroot, for culinary purposes.

The British naval blockade of Europe prompted a series of decrees by Napoleon in 1811 requiring the study and cultivation of sugar beet. Selection was successfully practised for increased yield and sugar content of the roots and in the 170 or so years in which it has been grown as a specialist crop the sugar content of beet has been increased from about 6 per cent in the roots processed at Kunern to levels in excess of 17 per cent.

Over these 170 years an effective temperate-climate sugar producing crop has been established to supplement supplies from tropical cane plantations. However, there is increasing concern about the role that excess sugar intake may play in some human diseases and metaholic disorders and searches are being made for substitutes.

Sugar has three functions in food preparation but for the first two of these—bulk and texture—there are no obvious replacements. Most of all, however, we think of sugar as a sweetener and for this purpose several alternatives have been suggested.

Among the most promising of these are the fruits—the so-called serendipity berries—of the central African vine-like plant *Dioscoreophyllum cumminsii*. These contain a protein called monellin which has about 1,500 times the sweetness of cane sugar. Since it is the carbohydrate nature of sugar that causes problems in the diet of, for example, diabetics, the availability of a protein sweetener would provide considerable advantages.

Investigations are at present under way aimed at introducing the sweet-berry into cultivation—so we may be close to the birth of an entirely new protein monellin will find a wider than in medicinally defined diets.

So crop species decline in importance and are lost from cultivation or decline in importance if their numbers are extended by the addition of species previously not cultivated. Other new crops can be introduced through the synthesis of previously unknown species by breeders. An example of the latter is from the combination—following hybridization—of the chromosome sets of radish (*Raphanus sativus*) and species such as the cabbage (*Brassica oleracea*).

The derived forms, which are called *raphanobrassica*, are being studied for considerable promise of success as fodder producers at the Scottish Plant Breeding Station. In this instance a particular advantage in the new crop lies in the combination of the different and complementary resistance to diseases inherited from each parental species.

Another example of an artificially synthesized crop species is triticale which combines the chromosome set of wheat with either bread wheat *Triticum aestivum* macaroni wheat *Triticum turgidum* or rye (*Secale cereale*). Triticale resembles wheat in plant form and ear type but in some environments is more robust and vigorous. It offers the possibility of the cultivation of a grain similar to wheat, in marginal environments to which rye would otherwise have been better suited.

Commercial varieties of triticale have been introduced in Hungary (where it is grown on about 15,000 hectares), Spain and Mexico. The most extensive breeding programme on it is being undertaken at CIMMYT (the International Centre for Maize and Wheat Improvement) in Mexico where notably beneficial advances have been made in agronomic characteristics and in yield.

Results so far show that triticale will fit well into highland agriculture in such areas as Ethiopia, Kenya and Mexico. Work at the Plant Breeding Institute, Cambridge, reveals that there are still problems to be overcome in respect of strength, in premature germination of the grain and in yielding ability, before this new crop could be introduced into the highly productive agriculture of Western Europe.

Clearly we have not seen the end of the exploitation of the resources of the plant kingdom by agriculture: it is unlikely that a stable position will ever be reached as new resources are realized and as the inventiveness of plant scientists and technologists reveals new potentialities. Consequently great importance attaches to the conservation of the genetic resources both in taxonomic groups already used by man and in those whose value has not yet been recognized.

The first steps are already being taken to conserve the most important of the threatened crop groups and it is particularly welcome that the Consultative Group for International Agricultural Research has established, and provided funds for, an International Board for Plant Genetic Resources. But much remains to be done if the dynamics of crop development are not to be hindered.

The author is director of the Plant Breeding Institute at Cambridge University.

What makes this Rover a front runner

by David Bache

High-level engineering has long been associated with the Rover marque; the cars generally having a high degree of originality and thorough attention to detail in their design that made them peculiarly "British-engineered" in character. The new Rover 3500, with its radically different marketing emphasis, might to some eyes appear to be a complete break with the engineering traditions epitomized by the Rover 2000 series, the three-litre and the many "P4" models before it. Yet on analysis it reflects the same spirit of independent engineering thinking, the same response to changing requirements.

When development began the energy crisis was three years into the future, yet already there was a strong feeling that conservation of materials in manufacture, and conservation of fuel in use would be of ever-increasing significance. Likewise, although inflation was yet to suffer the rise which accompanied the Yom Kippur debacle, it was clear that extremely cost-effective design was necessary to enable the new car to be sold in a similar price bracket to its predecessors.

Also crucial to the concept of the body-shell was the requirement for higher rates of production—the car was deliberately aimed at broadening the appeal of the Rover marque, particularly in export territories: current demand is even higher than expected.

Hence the previous "base unit" skeleton structure and bolt-on skin panels of the 2000 series car (which design had served its purpose well in a rather different era) was rejected in favour of a carefully designed monocoque structure. This gave more efficient use of sheer steel and thus controlled weight—a vital factor in fuel economy.

In addition, the reduced complexity of the all-welded construction eased the process of body assembly and its cost. As with most recent Leyland designs, the motor insurance repair centre at Thatcham were consulted during the body design period to ensure that the body would be easy to repair after minor accidents.

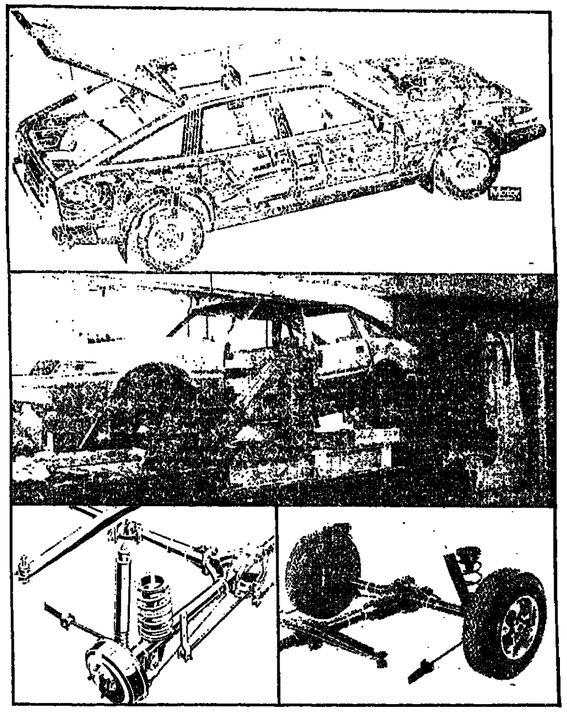
The styling team had a tough assignment in producing a shape which would fit the Rover image yet at the same time appeal to a much wider range of customers—particularly those with sporting tastes. A bold decision in 1970 was the adoption of the hatchback, semi-estate concept on a middle-class saloon car, when orthodoxy decreed a conventional boot.

The aerodynamic approach to body design, as typified by Citroën, had long been respected by Rover designers (the Rover 2000 would have had a lower nose profile but the cautious management of the time decided to retain a conventional air intake) and for this new model a low drag profile was evolved.

The air intake for engine cooling was combined with fog lamp mountings and transverse air dam in one large ABS moulding. By moulding this under-nose apron, it was possible to obtain the precise shaping of the air intake vanes required for good airflow and crisp appearance while a further major advantage was the corrosion-proof nature of what is normally a very vulnerable area of the body.

Clearly one-quarter scale models produced drag coefficients (Cx) as low as 0.32, and the final production vehicle has a Cx of about 0.39, complete with four sunroof flaps, large door mirrors and radio aerial. Most conventional saloons of similar size have drag coefficients of between 0.42 and 0.48. The fast back shape, which suits the fifth door configuration, also gives stability benefits, with a rearward centre of pressure—an important factor on a car which can reach 130 mph.

Impact safety is a major consideration in car body design today—legal requirements for various kinds of impact (barrier, pendulum, roll-over etc.) are becoming more stringent and widespread every year, so any new design must be laid down with an eye to the future. The Rover 3500



The Rover 3500. Top—under the skin. Middle—controlled crushing of a body-shell. Bottom right—rear suspension; and left—detail.

has the classic rigid passenger compartment with energy absorbent end structures system which is almost universal now.

An unusual feature, which derived from the Leyland ESV cars shown in 1974, is the use of longitudinal compression struts inside the doors, just below the glass line. These provide a solid load path on impact via small "proximity" pads located inside the door shut faces and on the door pillars, which contact each other after a small deformation.

The development of the correct crush characteristics for optimum energy dissipation on impact is a fast developing science. Sophisticated computer techniques have eliminated the old practice of using an over-generous safety factor and then using empirical tests. The high cost and time consumption involved in impact testing necessitates a "right first time" approach.

To this end, an early prototype body-shell is placed on a crush rig and steadily crushed by hydraulic rams. Because the rig is controlled it is possible to analyse the deformation process in a way which would be impossible in a normal impact test.

The data obtained from various controlled crush tests is suitably adjusted from experience with actual impact tests, and can then be used in computer simulated impacts which will indicate areas requiring modification. Hence a bodyshell design may have undergone many simulated impacts before an example is finally committed to destruction against a real barrier.

One such barrier test carried out recently gave interesting results. Although no legal requirement yet exists for a one-third overlap impact into a rigid barrier at 30 mph, a Rover 3500 was subjected to this particularly severe test. Not only does all the energy have to be absorbed by one corner only of the nose structure, but in addition, if the impact is taken on the driver's side, the collapse characteristics of the steering column are tested to the full. To further aggravate the situation, the driver dummy in this test was left unrestrained, with no seat belt or any kind.

On the American standard of fifty units (on which death is assumed to have occurred at 1,000 units), the driver registered 286 units, while the passenger dummy, which was restrained by a belt, registered 19 units. This represents an unusually high level of protection, greatly assisted by the analytical techniques described above. For, in safety engineering, there can be no simple approaches—an over-rigid structure can be more dangerous than a weak one.

There are other areas in the body design and tooling where the computer has made big strides. The Rover bodyshell has gained from considerable experience gained within Leyland over the past 10 years in the "smoothing" of panel shapes taken from original clay models, and the digitization of such shapes on to three dimension recording tapes which can then be used for the production of drawings and the machining of press tool dies. This accurate transfer of complex shapes not only ensures that the subtleties of style are carried through into production, but also helps to improve the quality of body assemblies.

It is perhaps in its mechanical design that the Rover points out the most significant engineering trends, particularly in rear suspension design, described in detail below.

A well proven power unit, the all-aluminium V-8 engine was improved in detail to raise its maximum rpm and give better breathing, with revised hydraulic tappets and electronic ignition, together with better cylinder head porting and manifolds. Experimental work with exhaust manifolding on the prototype "BS" mid-engined sports car in the late 1960s had shown that power benefits of phasing the outlet pipes to give an extractor effect; this principle was used on the new exhaust manifolds, which have dual outlets each side with cylinders 1 + 5, 3 + 7, 2 + 4 and 6 + 8 linked.

In order to achieve the legally required control on exhaust emissions, the latest version of this engine is fitted with SU HIF-type carburettors, which have automatic fuel temperature-viscosity compensation, while the air intake is temperature-controlled by the inward-winning air temperature control (ATC) unit, which uses a very simple bi-metallic strip thermostat device to mix hot air from an exhaust manifold "oven" and cool ambient air. A gear-controlled intake air temperature is important when using the lean all-fuel mixtures necessitated by pollution regulations, and also assists fuel economy.

With electronic ignition, it was relatively easy to fit a diagnostic facility for checking timing and ignition performance—a simple magnetic transducer senses crankshaft position of the front crankshaft pulley.

Again pursuing the ideals of maximum economy in materials and fuel, the five-speed gearbox fitted to manual versions of the Rover is in fact a corporate design which was conceived as a highly adaptable unit, capable of being fitted into a variety of models. The up-geared fifth-speed is overhung behind the main gearbox, which can readily be built in four-speed form if required. A construction exploiting high-volume, low-price taper roller bearings (identical to those widely used as wheel bearings) makes this gearbox particularly easy to assemble.

The gear clusters and selectors are all assembled onto a sandwich plate beforehand, and this sub-assembly then slots straight into the main gearbox casing. Conventional gearboxes require a large access hole in the casing to allow assembly of the selectors *in situ*—the Leyland gearbox (designated by the spacing of the shaft centres, 77mm) has a considerably stiffer gear casing because no access hole is needed.

Another unusual feature is the provision of positive lubrication, via a small low-pressure pump to the various bearings: in particular the spigot bearing is protected during prolonged idling, as in warming up or traffic jams. By providing an up-geared 5th ratio of 0.833 :1, exceptionally high gearing of 28.8 mph/1,000 rpm is achieved, which not only improves economy by a simple reduction in engine speed, but also ensures that the engine operates predominantly under full torque and at maximum efficiency, using the lowest part of the specific fuel consumption curve.

It is in the rear suspension design that the most deceptively subtle engineering thinking and development have taken place. It was an exceptionally bold step to commit the design team to the achievement of high standards of ride and refinement with a live rear axle on a car of this type and price. By going back to first principles, a very original and rigorous design solution was worked out, which in fact is patented by the company.

A live axle has obvious advantages in terms of simplicity, durability and cost, but while good handling is relatively easy to achieve with careful location and damping, what is difficult is the combination of all these factors with good ride and vibration isolation.

A major factor in the success of the design is the provision of generous fore and aft compliance without compromising lateral location. This is done by allowing the front cross-member, which carries the location bracket for the nose of the "torque-tube" type differential housing, to swing on its mountings quite freely. However, virtually no lateral movement is allowed, and in conjunction with the rear Watt linkage, the axle is very precisely controlled to eliminate any significant "bump steer" effects.

Also important to the standard of comfort is the provision of large spring travel (23cm) with constant rate springs. With a large hatchback saloon of considerable load-carrying capacity (up to 550kg), the use of low-rate springs for a soft ride could have led to sagging problems but these were avoided at relatively low cost and without any manufacturing or service complexities, by using Boge self-levelling damper units, which make use of the very suspension energy which they have to dissipate anyway to maintain the car near to normal ride height, regardless of load.

These completely self-contained dampers were very carefully located in the lines joining the wheel centres and the torque tube nose pivot, thus ensuring that both bounce and roll modes of suspension movement would be equally controlled.

Implicit in this apparently simple suspension design was the requirement for a low floor-level to maximize the stowage area and also a safety location for the fuel tank, which is entirely ahead of the axle and partly beneath the rear seat, well away from impact deformation zones.

The torque tube principle assists with space saving, since the arc of swing is more compact than with a normal propshaft and live axle—and in addition, the geometry of such a layout gives anti-squat properties under acceleration torque input, and conversely, anti-dive torque under braking, both useful properties in a high-powered car like the Rover.

The author is director of styling in the product engineering division of Leyland Cars.

Television 1

ORACLE of change speaks on the screen

by Howard Steele

In recent years educationists have become increasingly chary of accepting at face value the claims made for the role of new technology in the classroom and elsewhere. In view of some claims made in the 1960s this is understandable—but it does pose problems when it is no longer a question of crying "wolf" or engaging in "futurology" but of considering a major extension to broadcasting techniques that can be demonstrated here and now, and is already being transmitted daily as a pilot service.

Not very often—perhaps only once in several decades—does what began as a modest engineering research project show real promise of giving the public something completely new—a broadcasting facility that provides not sound, not television, but a means of broadcasting the written word and simple images in abundance, and largely free of the constraints of programme schedules: for such is teletext—or ORACLE as it is called by Independent Television and CEEFAX by the BBC. No other country has yet established a comparable service—though several are working towards this end.

Teletext, it is already clear, can provide a useful extension to broadcasting for the public at large—with the emphasis on news and information. But equally interesting, if still in an embryonic stage, are the possibilities it opens for socially-valuable services including optional captioning of television programmes for the hard-of-hearing and the provision of programme-related material for education and instruction.

ORACLE and CEEFAX were first demonstrated in the spring of 1974 by the IBA and BBC. Independently developed they differed technically though providing similar services. By the autumn of the following year a joint technical specification, drawing on the original ideas of both systems but with increased capacity, had been agreed in conjunction with the British television industry.

Experimental services were initiated by the BBC and the IBA in September 1974 (with the independent television programme companies assuming responsibility for the ITV transmissions in 1975).

Perhaps too optimistically, the broadcasters had anticipated that the necessary special "decoding" equipment would become available from industry in sufficient quantities to provide a realistic assessment of the experimental services before they were due to conclude in September 1976.

For a variety of reasons this did not happen and it has only been very recently that such equipment is gradually becoming available to the public, although still in very limited quantities and at considerable cost.

As a result the trial period has been extended until July 1979 by which time it is hoped that not only will the news and information services have been more fully developed but also there will have been time to explore in more depth the programme-linked and public-service aspects of teletext—and for ITV further investigation will be made into the question of how such services could be made self-supporting (or partially so) by means of advertising or special service functions. More also needs to be determined on the economics of the system.

And by 1979, the related Post Office interactive system "Viewdata" will have been field-tested using about 1,000 receivers, and a decision made on the start of an official Post Office service. Viewdata provides more pages more quickly than the broadcast systems but incurs additional costs to the user through its use of the telephone system. It is confidently expected that Viewdata receivers will be equally suitable for ORACLE and CEEFAX reception.

Broadcast teletext exploits the "wasted" time of a conventional television transmission—the blank periods between the individual pictures. Altogether every minute of picture transmission includes some 4-5 seconds of this "wasted" time, although these seconds are split up into many short gaps.

A very small part of this "wasted" time—just two "lines" (each 64 millionths of a second duration) in each television "field"- are sufficient, with modern technology, to provide a means of transmitting bursts of very high speed data signals.

It is all rather as though after every time the picture is traced out on your screen, a burst of high-speed Morse is sent, but at speeds vastly in excess of anything ever contemplated by the pioneers of telegraphy. Whereas a manual telegraphist achieves perhaps 20-30 words per minute, transmitting continuously, the teletext information goes out at an *average* of around 50,000 words per minute, and the actual transmission rate during the "burst" of data is far higher than this. If the height of a television picture is reduced, the data can be seen as twinkling dots on two "spare" lines at the top of the picture.

At the receiving end the incoming data bursts are separated from the normal television picture signals and then any single "page" of information can be selected and fed into an electronic memory. This in turn provides information for electronic "character generators" which recreate the original message (or simple still pictures) for display on the screen. In effect it is a marriage of television and computer technologies with "telecommunications" acting as best man.

This ability to "piggy-back" ORACLE information on an existing television transmission is one of the main attractions of the system to the broadcast engineer. He needs no additional transmitting stations, requires no more of the precious radio frequency spectrum, no new intercity links or distribution facilities.

For the broadcaster a teletext service can be established for a modest outlay (by television standards) on the equipment and computer to set up the data signals at studio or regional centre and additional costs in ensuring that the transmitter network will not degrade the data bursts.

His main costs are for the "wasted" the collecting, editing and sequencing information. These account for part of providing a teletext service depend, for example, on the hours each day during which and information pages are kept and of course the scope of the service provided.

Any means of broadcasting the word has special appeal to the hard-of-hearing. It is believed some 4½ million people come in general category in the United alone: in the United States, television. But of course such viewers more if material is directly related normal television programmes in of optional captioning; that is captioning across the lower part picture which does not appear the screens unless required.

As a result of experiments by the ITV companies, a special for this has been incorporated in the revised signal is turned from its digital form back into an analogue signal to be broadcast on the old-fashioned 405-line networks.

In 1962 a new requirement entered the orbit of the television engineer. Transatlantic live television became a possibility with the launching of telecommunications satellites. We not only had the problem of the numbers of lines in each complete image scan—the Americans use 525—but because their public electricity supply operates at 60 Hertz instead of 50 Hertz, as in Europe, they have ten more television field scans per second.

The techniques developed for use in the standards converter from 625 lines to 405 lines could be extended to deal with differences in field scan rates as well. It will be obvious that for every picture element of the incoming picture there must be some moment when it would be appropriate to use its information in the assembly of a picture scanned on an entirely different television standard.

The technique is again to sample the incoming signal, store each element until it is required and then pass the signal into the output. The period for which each element has to be stored varies according to the position which it must occupy in the scanning raster of the new system and upon the relative (and unsynchronized) timings between the two scanning rasters.

Every element thus requires a different amount of storage but this can be predicted given knowledge of the relative positions and timings. The field store standards converter operates by directing the incoming signal elements through electro-acoustic paths which delay their emergence until the appropriate instant. A hierarchy of delays with high-speed directing switches performs what one of its inventors, called "a Cossack Dance" to carry out the switching logic at very high speed and with precision. The delay paths are polygonal blocks of quartz, carefully temperature-controlled, in which the signals are caused to echo around until their exit is due.

The first all-electronic field-store standards converter was demonstrated in August 1967 and an advanced version made its debut in time for the Olympic Games from Mexico City in October 1968, producing colour pictures on the 625-line PAL standard for Europe from the American NTSC colour television transmissions received by satellite across the Atlantic. More than 300 million viewers throughout Europe saw the pictures it produced.

As the communication satellite facilities have grown to the point where pictures may be originated almost anywhere, the ability to convert not only from one scanning standard to another but also from one colour system to another has been an essential factor in the world-wide coverage of events of international interest.

The rapid development of digital techniques applicable to television, with the new-found ability to carry out switching and sampling of analogue signals at rates producing pulses counted in many megabits per second, clearly demonstrated the need to develop a digital field converter as a corollary to the digital line converters which have proved so successful in the operation of the television service duplicated on 405 lines. Such a field converter was developed by engineers of the Independent Broadcasting Authority and first went into service in November 1972.

This apparatus is also in regular service and performs the extremely complicated digital processes upon the signals that have been derived from sampling and coding the incoming analogue television signals. When it has rearranged the information in such a form that an image portrayed in the incoming signal is now at a new line-scanning standard and on a new field repetition rate, the signals are then reconstituted into analogue form for transmission as though they had been originated by the television camera on that particular standard. Transcoding between the different systems of colour, NTSC, PAL or SECAM, is carried out at the same time and by the same device.

It takes a very experienced engineer to recognize, in a modern standards-converted picture, the small signs that it was not originated on the standard being displayed. The expert watches for minor imperfections in the portrayal of motion since the progress of an object moving through the scene is arrested and portrayed at certain discrete intervals by the original scanning process; it is displayed after conversion at different discrete intervals dictated by the scanning standard to which the pictures have been converted, and the perfection of interpolation required for satisfactory portrayal of motion is very hard to achieve. Modern converters are almost perfect.

In spite of standards converters and satellites, the international exchange of television programmes is still very much restricted by the problems of copyright, and language and time differences. Even in Europe, where the technical standards are often the same and time differences are small, exchanges are, in the main, restricted to programmes such as the Eurovision Song Contest and *Jeux sans Frontières*.

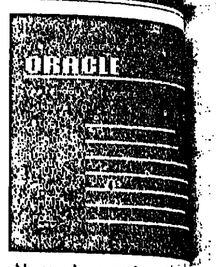
Language is not a problem in North America; but copyright and time differences, coupled with the problems of scheduling, have ensured that most entertainment programmes are still exchanged on film—a truly international standard. For similar reasons, the big coproductions for world-wide distribution, such as Age of Uncertainty, America, and The Ascent of Man, also use film.

But the combination of standards converters and satellites is a powerful one; standards converters permit programme exchange on any television standard and satellites permit immediacy. The use of both provides complete flexibility.

As a result, it is possible for the world "to be there" during great events such as the Olympic Games; and to receive news reports as quickly and as detailed as in the country of origin. Wars, and the methods of conducting them, are no longer private affairs and the effect of worldwide and immediate reporting on public opinion can be considerable. The comprehensive reporting of the Vietnam war is a good example.

The world is now a very small place for communication terms and we are much better informed because of it. The modern viewer, however, tends to take it all for granted and complains a little if the subtle colourings in an event taking place on the other side of the world are to the slightest degree less perfect than those from a local studio. It was a BBC engineer who, on the occasion of man's first landing on the moon logged the picture quality as being "somewhat substandard".

The author is director of engineering, British Broadcasting Corporation.



Above: An example of the kind of information that would be available on ORACLE. Right: how it would appear to the viewer at home.



Television 2

Into Europe without wobble

by James Redmond

Television crossed the sea for the first time in 1951, when a team of BBC engineers took one of their early 405-line black-and-white television outside broadcast units to Calais and viewers in southern England were able to see "live" in their own homes scenes that were usually only associated with overseas travel. The television signals were beamed by radio link back across the Channel to a receiving point near Folkestone and thence in two hops to London.

In the 26 years that have elapsed, international television has become commonplace and the whole world now expects to be able to participate by television whenever an event of international interest takes place anywhere on earth or, for that matter, in space.

The early satellite transmissions across the Channel were, in comparison with today's domestic operations, but the interest aroused by that first venture made it imperative that we should be able to take the output of the French television service and relay it to viewers at home.

Here was the snag. French television used a different number of lines to scan the pictures, and British television receivers would not have recognized the alien impulses had we been able to coax them through the transmitter at Alexandra Palace. We would have to convert the French television images to suit the scanning rasters which British television sets had been designed to expect.

At that time there were several television scanning standards in use in Europe. Some countries were already using the 625-line standard which, it had been agreed, would eventually become a common standard for all Europe. In Britain the BBC was using the 405-line system with which it started television broadcasting in 1936; while the French were currently using two different standards; 441 lines and the very ambitious 819-line system, side by side.

For those countries which had started television after the 625-line standard had been adopted, exchange of programme material from the technical point of view would merely require the provision of suitable international links but the problems of programme exchange between countries using different television standards had still to be solved.

Various workers had written theoretical papers on this subject, suggesting that conversion might be achieved by so obvious a proceeding as televising the picture on the original standard and viewing the display with another camera working on the new standard. The principle of "image transfer" standards conversion, as this came to be called, is very simple but the achievement of satisfactory results presented severe technical problems.

The fundamental difficulty is that, although a television picture may appear to be continuously present on the screen, it is made up of only one single very small bright spot travelling at a speed in excess of 7,000 miles an hour to write in the 405, 625 or 819 lines in one-twenty-fifth of a second and then begin all over again. Persistence of vision in the human eye makes the scanning action of the spot [illegible] it were at all points [illegible] The television [illegible] did not offer [illegible] enjoyed by the [illegible] eye and the standard-converted [illegible] from a passage through [illegible] of cascade suffered [illegible]

Early [illegible] the BBC research department [illegible] way to make acceptable standard conversions by using rather special camera tubes to display the picture before conversion, and by employing a relatively new type of camera tube which had the ability to remember for a short while what it had seen and thereby offer some substitute for human persistence of vision.

There were other problems. In those days it was necessary [illegible] picture repetition [illegible] to be locked to the alternations of the public electricity mains supply, the large transformers incorporated in television receivers of the day would otherwise impart to the television picture a most undignified sideways wobble.

Alas, the French public electricity supply was not synchronized with ours and when an overload of the national grid on either side of the Channel caused generators to slow a little, there might be as much as one whole image scan difference in the nominal fifty images per second. However, the first operational converter was installed by the BBC with the friendly cooperation of French television on a hill-top at Cassel in France, inland from Calais and about 40 miles from Dover.

In July 1952 a series of transmissions was originated in Paris and broadcast in England. During 1953, a concerted effort by a large number of European countries brought into being the Eurovision network for international programme exchange and the BBC installed a permanent standards-converter at Tolsford Hill, the British terminal of the cross-Channel links. This converter was designed to handle incoming signals from either of the two main continental European standards, i.e. the 625-line international standard or the 819-line French standard.

International exchange of programmes soon became a familiar feature of television in Europe although there was, of course, no means for intercontinental exchange: sea-paths could not exceed the most that could be achieved by single-hop television links and for most practical purposes this is still limited to something less than 100 miles.

[illegible] was for the [illegible] perform the standards [illegible] 16, 1957, the BBC installed [illegible] to convert from 405 to 625-lines in the outgoing direction, England to Europe. It was thus able to provide programmes via the agreed international standard.

In 1962 the Pilkington Committee, set up by the Government to consider the future of television, recommended that Britain should begin a gradual changeover from 405 lines, which had served us well since 1936, to the 625-line standard which was becoming uniform throughout Europe and other places where the frequency of the public electricity supply was 50 Hertz.

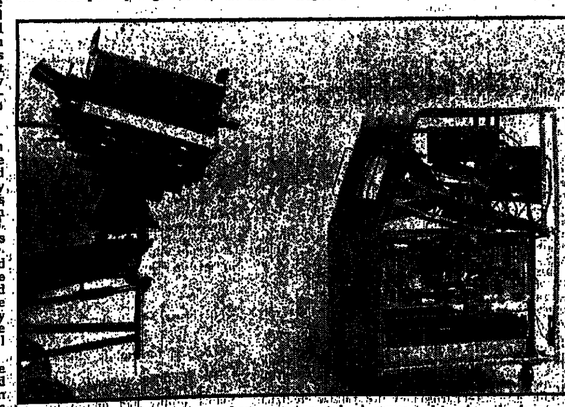
The technical necessity to lock the television image repetition rate to that of the mains supply had diminished with improved technology and television receiver design but caution dictated no radical disparity between the two. The eventual two different television standards broadcast side by side in the same would place a high premium on and trouble free standards conversion.

The two early French systems carried entirely different programmes which could be originated using standard appropriate to the but the plan in Britain was to the same programme on both Hence we needed to have cameras in our studios operating of the standards with means for ing to the other for the benefit of whose receivers worked only on particular number of lines. Obviously television cameras should be set on the new and higher definition —625 lines—with conversion from 405 for transmission on the old work.

By 1963, BBC engineering department had developed electronic standards converter with a complete departure from the transfer or "optical" system used. The techniques used in converter included high-speed and sampling processes similar which were becoming familiar speed computers. Some of the switches operated at a rate corresponding to 18 million rpm and the included between 2,000 and 3,000 sistors—at that time an almost number, to be included in apparatus.

Domestic standards conversion a part of our everyday operations rent estimates are that it will be to close down the old 405-line networks for re-engineering in the 1980s, some 20 years after recommended they should be given Until then, we must continue to 405-line images from the 625-line on which our television is based the latest line standards cannot longer operate upon analogue The incoming 625-line television form is sampled, marshalled "quanta" and the information each sample is then coded into signal.

The rearrangement of information time and space, necessary to picture which corresponds with standard, is now carried out by techniques used in sophisticated When the shuffling has been



A sample standards converter where a camera tube is arranged to view the image on a cathode-ray tube screen.

The author is director of engineering for the Independent Broadcasting Authority.

What do you mean by 'sweetness'?

by K. J. Parker and A. J. Vlitos

While everyone would claim to know what is meant by sweetness, it is far from easy to arrive at a precise description. The perception of taste is an individual experience which does not readily lend itself to exact measurement. Without either an objective definition of the property of sweetness or means of quantifying its intensity the search for a valid relationship between sweetness and the chemical structure of a substance evoking the sensation is likely to remain unfruitful.

Nevertheless, interest in this difficult but challenging subject remains undaunted, spurred on by the demands of dieticians, physicians and soft-drink manufacturers for an acceptable harmless non-carbohydrate sweetener.

So far all known sweet substances have been discovered accidentally, there being no certain guide from the chemical structure that a compound will be sweet. The diversity of substances which are sweet ranges from such simple compounds as chloroform, salts of the metals beryllium and lead, through sugars and amino-acids to sulphonamides (which include saccharin and cyclamates), complex terpenoids and proteins. There appears to be no property or molecular feature common to all these substances which alone could be linked to sweetness.

The intensity and quality of sweetness does vary widely, the sweetest known substance being the protein, thaumatin, the sweetness of which, compared with a just detectably sweet solution of sucrose, approaches 100,000. Sugar or, more specifically, sucrose, traditionally becomes the standard with which other sweeteners are compared.

In such a comparison the characteristic flavour of other sweeteners show significant differences, though these are not easily described. For example, the nuance of sweetness of glucose can be described as flat and harsh, of fructose thin and fruity, of xylitol cool, of saccharin bitter and of the protein monellin liquorice-like, though such impressions tend to be very subjective.

The variation in the quality of sweetness observed between sweeteners and between individuals suggests that the perception of sweetness is not a unique stimulus but there may be a spectrum of sweet responses. To understand how this might arise it is necessary to consider the more general mechanism of taste as currently understood.

The psychophysical approach to taste perception, which is concerned with the conscious impression of taste, differentiates four primary stimuli: sweet, bitter, salty and sour. All tastes are regarded as combinations of these four primary tastes, though, of course, the total flavour impression also includes tactile (for example, "mouth-feel") and olfactory stimuli.

The opposite school of thought classifies tastes as points in a "multi-dimensional space continuum". This approach is less rigid and provides a simple means by which different perceptual attributes of flavour—for example, astringent, metallic, phenolic—can also be represented. Such a model is supported by direct experimental evidence from physiological studies on animals, though it does not follow that human taste experience is exactly parallel to that of a test animal.

During the past 35 years considerable progress has been made in understanding the mechanism by which the sensation of taste is conveyed to the brain. The tongue and palate are involved in gustatory perception, which is readily distinguishable from olfaction, or the sense of smell, though the two senses together provide an overall appreciation of flavour.

Taste is stimulated by saporous molecules in solution interacting with receptor sites on the surface of so-called tastebuds which are grouped into clusters known as papillae. Each receptor site is served by a single nerve fibre which transmits the stimulus as an electrical discharge to the brain, which can be detected and related to specific receptors. By this means it can be shown that individual receptors are very sensitive to specific stimuli, of which the four primary taste qualities can be distinguished.

There is evidence to suggest that different receptors respond more strongly to specific sweet molecules and that these differences are genetically controlled. This is seen as variations in individual taste impressions and in the observed spread of assessments among members of a taste panel, which is, of course, selected to obtain close uniformity of taste perception.

Although it is convenient to represent taste sensation as a composite of four primary stimuli, analogous to the three primary colour standards of the visible spectrum in colour vision, there is little evidence in support of the analogous physiological mechanism.

Consequently, in seeking a relationship between sweetness and chemical structure, it is not necessary to accept the premise of a unique all-embracing molecular stimulus, though it would be satisfying to find this. Several receptor types, all of which transmit a signal interpreted as sweet, could coexist, each being responsive to a particular molecular pattern in the sweetener.

Early attempts to relate chemical structure to sweetness attributed to certain molecular functions the property of exciting a sweet response. These were termed "glucophores" by analogy with the corresponding functional groups in coloured substances, termed chromophores, which absorb light strongly thereby imparting colour. By the same analogy it was proposed that secondary functional groups, corresponding to the auxochromes in light absorption, termed "auxoglucs", are also necessary for the development of a sweet stimulus.

For example, the hydroxyl function alone does not elicit sweetness—alcohol is not sweet—but additional hydroxyl groups are associated with increasing sweetness, as in the series—glycol, glycerol, xylitol. But there are many exceptions to this simplistic approach: *D*-protoquercitol with five hydroxyl groups is not sweet, while β-*D*-mannose, a sugar, is actually bitter. The delicate dependence of sweetness on molecular structure is most dramatically illustrated by galactosucrose which is tasteless, the only difference from sucrose being that the hydroxyl group at position four projects out of the plane of the glucose ring.

Professor Robert Shallenberger of Cornell University has advanced the most comprehensive hypothesis of the molecular basis of sweetness so far, though further modification has since proved necessary to encompass a wider range of sweet compounds.

According to his postulate the molecular structural criterion of sweetness can be represented by a dual function, the AH . . . B system. A and B are electronegative atoms, with a spatial disposition such that the A-H proton donor distance is almost exactly 0.3nm. It is conjectured that this is complemented by a similar configuration of atoms on the receptor, such that hydrogen bonds are established between the receptor and sweetener, resulting in a redistribution of electric charge and triggering of a nerve impulse.

The importance of a precise fit between the sweetener and the receptor is emphasized by comparing compounds differing only in the spatial disposition of their functional groups. Amino acids of the natural *D*-series frequently taste sweet, whereas their mirror-image L-enantiomers are tasteless or bitter.

On the other hand, the series of simple carbon sugars, known as hexoses, are all sweet in both the *L* and *D*-forms, though not necessarily equally sweet. This is explained by the dual character of the hydroxyl group which can function either as a proton donor (AH) or proton acceptor (B). Hydroxyl groups are thus readily changeable, and the molecule can take up a conformation having the necessary disposition of groups.

Amino acids do not have the same opportunities as reducing sugars for reorientation, nor are the AH (NH$_2$) and B (COO$^-$) groups interchangeable. The importance of this freedom is seen in such molecularly constrained compounds as sucrose or the inositols: an essential hydroxyl group structurally out of alignment cannot be corrected by any available molecular contortion and sweetness is lost, as with galatosucrose or myoinositol.

This proposed mechanism applies admirably to simple sugars and amino acids and can be construed to include sweet substances such as chloroform, beryllium salts and benzyl alcohol. However, it becomes difficult, for example, to explain the lack of sweetness of the sugar raffinose or to extend the concept to sweeteners such as Dulcin (N-p-ethoxyphenylurea), while remaining within acceptable limits of credibility. It is certainly of no value in predicting sweetness since the AH-B criterion can be identified in numerous compounds which are not sweet.

It is probably true that a closely defined disposition of polarizable functional groups may be a prerequisite to exciting the sweetness response. It is also conceded that no one aspect of the molecule is the sole determinant of taste quality. Such factors as hydrolipophilic balance, water solubility, ionization, molecular weight, molecular shape, and energy and entropy of adsorption at the receptor, will each have its effect in determining both the simulus and the intensity of perceived sweetness.

If there are several types of receptor site involved, each with its characteristic template pattern, then sweet substances may be grouped into molecular types, each of which provides an identical sweet stimulus, the intensity of which depends upon how exactly the molecule fits the receptor slot and hence its partition between solution and the adsorbed phase. Such a mechanism would explain the phenomena of taste persistence, initial delay in perception, competitive and synergistic sweetness.

A complex molecule such as the protein, thaumatin (composed of 198 amino acid residues) shows a distinct delay of about a second before the sweetness develops which then persists after the tasting is finished. Certain substances reduce the after-taste, possibly by themselves combining with that part of the thaumatin molecule involved in generalized adsorption, while not interfering with the sweet exciting moiety. On the other hand, if the sweetness site is itself masked, as by a polyuronic acid, then it is no longer found to be sweet.

These hypotheses represent a gradually increasing understanding of the molecular mechanism of taste stimulation.

Dr K. J. Parker is general manager and Professor A. J. Vlitos is chief executive of group research and development for Tate & Lyle Limited.

25 years of development in textiles

by Trevor de Tute and Ismar Glasman

There is no doubt that technical developments which have taken place over the past 25 years in the UK textile industry have had a considerable social and economic impact on the consumer, not just in industry generally, but particularly in clothing, household textiles and in the leisure field.

In the late 1940s the natural fibres—cotton, wool, flax, jute and silk—dominated. Man-made fibres at that time were almost entirely restricted to regenerated cellulosics—viscose, acetate and Cuprammonium (Bemberg rayon). Together they accounted only for some 12 per cent of all fibres used. It is interesting to reflect that these developments were essentially empirical, since at that time little exact knowledge of the chemical structure of the cellulose molecule existed.

However, the developing science of X-ray crystallography was helping to establish links between chain building polymer structures and the science of fibre structures; especially wool. Consequently in the early 1940s in this country the application of this new-found knowledge was shown by the industrial production of nylon—one of the foundation stones of today's synthetic fibre industry.

Although during the Second World War many industries suffered through raw material shortages and redirection of effort the new viscose rayon and nylon fibres actually benefited. High-tenacity viscose rayon was superior to cotton for reinforcing synthetic rubber tyres and nylon filament yarns had properties that made them unique for parachute fabrics. Even then developments in the science and technology of textiles were seen to be one of the keys to future prosperity.

As already mentioned, the bulk of fibres in use at the end of the war were based upon natural raw materials which were in short supply and, being imported, were not easy to acquire. The emergence of nylon on to the textile scene in the late 1940s was followed rapidly by polyester, a totally British discovery. In the 1950s we saw the emergence of acrylics and polypropylene fibres with polyurethanes (elastomerics) following in the early 1960s.

Not only did these new fibres produce novel fabrics in their own right, but they were also suitable for blending with natural fibres.

Initially, these fibres were only available in continuous filament form, but technology soon introduced a number of modifications which greatly enhanced their appeal. Ways were found to produce cut fibre versions so that they could be spun into staple yarns thereby emulating natural fibres more closely.

Bulk was introduced by texturising or crimping the fibres to develop more wool-like aesthetics, especially in crepes. The growing range of yarns and fibre variants resulted in nothing short of a textile revolution by the early 1960s.

There are many examples which one could quote where fibre or yarn modifications have wide-ranging effects. The following represent only a few selected cases. The combined development of texturized nylon filament yarns together with the appropriate knitting machinery radically changed certain industries eg underwear, socks and stockings leading to pantihose. Untextured, or flat, nylon yarn was found to be ideally suited to warp knitting where machine innovation allowed the development of novel fabrics for lingerie and shirts.

None of these areas mentioned would have been capable of fulfilling customers' needs to anything like the same extent without these synthetic fibres and the innovative technology of the people involved, where fibre science and fabric technology were allied to fashion and consumer requirements.

In addition to the above technical achievements an important factor in the rapid success of synthetics was also their relative price stability, at least until the end of 1973, when world oil prices, on which most synthetic fibres depend for their raw material, were rapidly increased. Although prices in the early days were higher than for natural fibres, reflecting the initial high cost of research, development, manufacturing plant, marketing and sales, their price stability allowed a greater confidence in long-term planning production and sales commitments. Such stability is much more difficult to achieve with natural raw materials, depending as they do upon the vagaries of farming, agriculture and the weather.

Interestingly, the special characteristics of fabrics available from these new yarns—warmth with lightness, shrink resistance, drip-dry and crease resistance as well as hard-wearing properties—soon exposed the limitations of natural fibres, particularly their lack of easy-care characteristics. In their fight to remain competitive, in which they have been essentially successful, crease-resistant chemical finishes and shrink resist mechanical treatments were applied to cotton and rayon; permanent press finishes became a household requirement on cotton and polyester/cotton fabrics. Fibres based on cellulose, cotton and rayons, as well as some synthetic fibres, for example acrylics, are not inherently flame retardant.

Therefore we have seen over the last 25 years a determined effort by fibre producers, helped by chemical manufacturers, to develop flame retardant fibres by both structural modification as well as by chemical treatments to cellulosics. Such fibres, in fabric or garment forms, are now commercially available.

Recently, silicone elastomers have opened up new ways of producing shrink-resistant wool, giving machine-washable garments in competition with existing resin finishes. These elastomers are being further outlets, especially in acrylic fibres, whose performance properties are much improved.

With every chemical finish, particularly for garments worn next to the skin, the possible health hazard is sometimes for which the scientist must now test as part of his overall assessment.

All of these systems are aimed at fulfilling certain needs increasingly expected by the customer for easy-care garments washed by sophisticated domestic washing machines which have eliminated for many the back-breaking washdays of yesteryear, as well as the necessity for dry-cleaning.

Usually it takes 25 years or more for fundamental discovery to reach large-scale industrial application. In the case of man-made fibres, this time lag is much reduced. By 1960, they accounted for some 29 per cent of all textile fibres used in the United Kingdom and by 1975 this figure had risen to 39 per cent, of which nylon held a large share. This phenomenal growth has continued more or less unabated, so that by 1985 the usage of man-made fibres had reached 50 per cent of the total.

Despite the many advantages of synthetic fibres outlined above, their ever-increasing existence alone could not have achieved such a rapid and widespread success. Without their efficient conversion into woven or knitted fabrics to which dyeing, finishing and printing imparted the desired technical and aesthetic fashion parameters, as well as improved performance properties, their impact would have been greatly diluted.

Each new fibre, starting with the regenerated cellulosics, has needed dyestuffs and/or dyeing systems tailored to wool and cotton. The improvement of the dyestuffs manufacturers coupled with the engineering capabilities of the dyeing machinery builders, have ensured the successful colouration of these fibres to ever better standards. Fashion is increasingly asked for brighter and deeper shades, while the customer has demanded, quite rightly, better fastness to washing, dry-cleaning, light and rubbing on both dyed and printed fabrics.

All these needs have been met—and more. A fairly recent technological breakthrough has been the technique of printing complicated designs or even pictures directly on to a finished garment, by means of "hot pressing" a pre-printed paper.

This country, although not involved in the origination of the development, has taken a leading part in every aspect of the establishment and commercial exploitation of this latest aspect of colouration technology. During this development the expertise and flair of the British designers and colourists has played a considerable part. Reactive dyestuffs, which can be chemically bound to the fibre, were novel developments of British origin in the late 1950s and of considerable impact in terms of brightness and fastness.

In the field of water and energy conservation, dyestuff manufacturers and particularly machinery builders have in the last few years made a significant contribution with the ever-increasing use of dyeing machines which use low-liquor ratio systems as well as recycling techniques for both water and heat.

After fabrics have been dyed or printed, the effects have to be assessed. We are witnessing the practical applications of colour physics to quality control in these areas, where previously the subjectivity of the human eye was the sole arbiter of shade matching and acceptability.

In particular Marks and Spencer is in the forefront of developments to introduce more objective instrumental colour-measurement techniques, utilizing a British built colourimeter and computer software. We believe this approach will have significant ramifications, not only in process and quality control of fabrics, but also in minimizing garment rejects on account of poor colour consistency.

The changes which begin to take place in fibre, yarn and fabric manufacturing in the early 1950s heralded the growing involvement of the petro-chemical and allied industries, with their sophisticated engineering, planning and marketing.

The essentially fragmented approach to garment-making pre-war steadily gave way to more organized factory units. The large man-made fibre manufacturers realized the need to become more involved in stimulating consumer demand if they were to make efficient use of their bulk production units.

At the same time retailers, themselves becoming more rationalized, were seeking to exert more influence on the design and supply of the garments in their stores. The proliferation of new fibres and fabrics, whose performance characteristics were still being improved, developed the need in retailers, pioneered by Marks and Spencer, to employ technologists in order to relate the functional performance of garments and textiles to the properties of these new fibres.

It became clear that retail stores such as ours were an ideal vehicle for large-scale market testing of new products, whose quick results were as important for the fibre producers as they were to the retailer. Consequently some fibre producers began integrating downstream into fabric and garment production while at the same time forging closer direct links with technologists in retail companies. These closer relationships, if applied properly, could result in a faster, more professional approach to the economic, technical and aesthetic aspects of production.

Without a doubt these multidisciplinary technological developments have enabled the textile industry to fulfil the consumers' needs for increasing quantities of fashionable yet extremely functional clothing at prices which everyone can afford.

However, the consumer, who usually benefits most from technology is becoming increasingly influenced by the world-wide "ecological backlash" against it. How well it reconciles technology and the consumer will remain one of the main challenges for the textile industry in the future.

Trevor de Tute is senior technologist, and Ismar Glasman is technical executive in charge of dyeing and finishing, and yarn technology, with Marks and Spencer Ltd.

How BR got back on the right track

by Sydney Jones



Experimental advanced passenger train at 125 mph with 8 per cent tilt rounding a curve.

Modern science has tended to find its readiest market outlets in the sophisticated "science-based" industries such as aeronautics and electronics: it is comparatively rare to see industrial applications on a substantial scale, due in part to long term lack of competition.

But when competition becomes explicit and threatening the response can sometimes be dramatic. The case of road versus rail networks is a case in point. It resulted in the railways rising to the competition in a vigorous manner and solving one of its formerly major problems—the inability to reach competitive speeds economically.

About 15 years ago the British Transport Commission decided to build a large research laboratory, costing over £1m, as the first step in developing a competitive technology. The present research laboratory of British Rail is now one of the best-equipped and best-staffed of its kind in the world.

In the early days it sought to identify urgent problems, and the highest priority was given to an examination of the dynamic interaction between wheel and rail, as it was evident that predominant among the various technical problems inhibiting the commercial development of railways was the inability to reach competitive speeds at an economic rate.

Railways throughout the world had been subject to competitive pressure for many decades, but no satisfactory solution to this problem had been found, primarily because of a fundamental problem that had long been recognized, namely instability. At relatively low speeds, rail vehicles followed the track smoothly; but as the speed increased, a point was reached at which, however smooth the track, the vehicle would break into an uncontrollable lateral oscillation, initially barely perceptible but becoming quite pronounced as the speed increased.

Essentially the phenomenon is dynamic instability of the kind arising in any guidance mechanism that employs a feedback system of control. In railways, guidance is provided by coning the treads of railway wheels, so that a pair of wheels fixed solidly to a common axle will follow a curve in the track by moving laterally until the effective diameters of the wheels on the two rails are sufficiently different.

When the pair of wheels meets a disturbance on the rail it will oscillate laterally with a motion that, in a non-conservative system, may be expected to diminish as an exponentially decaying wave motion, with a wavelength along the track depending only on the coning angle of the treads. The frequency is therefore proportional to the forward speed.

The lateral oscillations are set in motion by forces between the wheels and the rails; and as the speed and frequency rise, so do the forces, ultimately to a degree at which "creep" becomes important, the amplitude of the lateral movements increased, and energy is fed from the forward motion to the lateral oscillation. In extreme cases the lateral motion increases until limited by flange constraints; considerable forces can then come into play and there is a danger of the vehicle leaving the rails.

The problem, so simple to describe but so complex in reality, proved impossible to solve over many years. Only recently has research work in British Railways yielded success, to the degree that it is now possible to design railway vehicle suspension systems capable of stable speeds up to 300 kilometres an hour and running, in an economic manner, at beyond.

This success could not have been achieved without the employment of a mixed team of science-based engineers with experience of both railway engineering and allied problems in other fields (notably aircraft vibration phenomena and closed-loop stability criteria), and equipped with large computing facilities and modern instrumentation.

The work, which was recognized with a McRobert Award in 1976, stimulated thinking about the optimum design of trains, and led both to the design of the bogies for the High Speed Train and to the concept of the Advanced Passenger Train (APT).

The High Speed Train represents the modern railway engineering practice which is based on a new bogie permitting train speeds of up to 125 mph (200 kph) to be achieved where track curvature is sufficiently gentle. The Advanced Passenger Train increases performance still further in a number of important respects for it allows:

- stable running up to speeds of 250 kph;
- powered tilt of coaches to enable curves to be taken at speed;
- economy of design concept, for example in the use of one bogie per coach and the articulation of coaches in such a manner that on a curve there is minimum encroachment outside the volume occupied on straight track;
- low aerodynamic drag and lightweight construction to reduce fuel consumption;
- low unsprung mass to reduce pounding forces on the track;
- powerful braking to match the speed;

It is hoped that the phased introduction of these two trains into public use will meet future demand for high-speed rail travel up to the end of the present century. It is no exaggeration to say that for the first time in their history, railways are now able largely to satisfy the demand for comfortable high speed ground transport in an economic manner.

In addition to making trains run smoother, faster and more economically, other aspects of improvements in system performance are being pursued, notably signalling, on which the fullest use of the track heavily depends. Already the "two-aspect" (stop go) semaphore signals have been widely replaced by the "four-aspect" system of coloured lights (stop, two levels of caution, go), and the manual movements of signals and points is rapidly giving way to remote electrical control, with the considerable saving of unattractive jobs that are difficult to fill.

A further development is the fact that the location and state of readiness of a vast fleet of freight wagons—information essential to efficient management—is now controlled through a data communications network coupled to a data store. And the "slab track", a form of railway construction in which the rails rest on a continuous slab of reinforced concrete or other suitable material, is in an advanced state of development.

One question that often arises is whether these developments are too late in the history of rail transport. One has only to compare the convenience and relative luxury of the modern motor car with the relative inconvenience and squalor of much train travel to have considerable doubts about the future of rail.

If the trends in forms of transport of the last few decades foreshadow the developments of the future, then one can hold out little hope for a general rail passenger—and hence freight—network. There are however, three very important factors which bear on the future pattern of events, namely:

- the technical developments already achieved put railways in a good competitive position and provide a springboard for further future developments;
- economy of fuel and materials of construction will become dominant considerations in the near future;
- growing resentment of pollution of all forms, noxious exhaust fumes, noise and visual intrusion, are becoming evident.

These considerations, taken together, lead to the belief that public rail transport will find more favour in the future than recent events would tend to indicate. Perhaps the greatest obstacle to such a change might be the failure of decision-makers fully to appreciate the changing opportunities becoming available; together with the sheer momentum of current events and their own limited logic of self-destruction: "More cars, more roads; more roads, more cars."

Once this present trend is checked, a cumulative movement in a more desirable direction could quickly be established. As railways are a fixed-track system with considerable investment in the track, they are said to be "volume-hungry"—in other words the investment in the track can only be justified if it is used by sufficient revenue-earning traffic.

Unit costs will therefore diminish, with a consequent increase in traffic, and more freight as well as passenger traffic will be encouraged to use the system. Further technical improvements, for example in signalling investment to improve track traffic-handling capacity, will also be stimulated.

Such a beneficial change from a decaying to a growth industry can, however, only proceed to a limited degree, as the convenience of the private car will not be readily abandoned. The fullest development of ground transport in the future therefore requires not only a road/rail freight system (on which some work is being done) but the proper integration of the convenience of the private car with the economy of rail. This will require a radical reconsideration of the respective roles of those two modes of transport.

The author was until recently board member of British Railways for research and engineering.

BRITISH ASSOCIATION

BA NEWS

Pride of presidents

To attempt to pick out *all* the highlights of the forthcoming British Association Annual Meeting at Aston would be not only invidious but also impossible. Out of a programme of over 300 papers, symposia, special and public lectures, however, it should not prove difficult to find many which will command interest. And among these, certainly, will be the presidential addresses.

For those not already familiar with the way in which the BA organizes its annual meeting, and general business throughout the year, it should be explained that for the sake of convenience and also partly as a result of historical development, the sciences are divided into 17 "sections". There are those who argue that 17 is a large and unwieldly number, and others who say that the divisions are not sufficiently fine and would like to see the number increased.

Sometimes a section chooses a theme to run through all its papers, for example, section L (education) this year, will speak on "improving the quality of education", while section F (economics) is devoted to "the economics of devolution". Sometimes sections combine to present an interdisciplinary symposium, of which two at Aston will be on "ageing" and "cancer".

Each section is headed by a president, a scientist distinguished in his or her own field and whose presidential address at the annual meeting is regarded by many as one of the most important statements of the year in that particular branch of science.

Section A & A*/mathematics and physics: Professor Harold Hopkins, FRS, professor of applied physics, University of Reading. "Optics in clinical medicine". —an account of the invention of fibre optics and new types of lens systems and their influence on clinical practice, and a review of some of the possible applications of the laser in endoscopy.

Section B/chemistry: Professor Charles Kemball, FRS, professor of chemistry, University of Edinburgh. "How do catalysts bring about chemical changes?". A review of the evidence gained in recent years about the nature and reactivity of adsorbed intermediates and their importance for understanding the mechanism of catalytic processes.

Section C/geology: Professor M. R. House, University of Hull. "Evolution Observed". The diverse revolutionary patterns of fossil ammonites over 300 million years enable a detailed timescale to be established which is used for international correlation of rocks.

Section D/zoology: Professor P. C. C. Garnham FRS: emeritus professor of medical protozoology, Imperial College of Science and Technology. "The continuing importance of field work in zoology", or, avoid the corridors of power and the chromium-plated laboratory: instead make your observations under the natural conditions of the forest, steppe or desert.

Section E/geography: Professor Karl Sinnhuber, professor of geography at the University of Vienna. "Recreation in a mountain environment". To what extent is the environment capable of absorbing a further increase of recreational uses without detrimental effects?

Section F/economics: Professor E. T. Nevin, pressor of economics, University College, Swansea. "The economics of devolution", which examines the White Paper of November, 1975 proposition that "the proposed assemblies for Wales and Scotland will be able to exert a very marked effect of the economic environ-

Section G/engineering: Sir Frederick Warner, pro-chancellor of the Open University. "The environment for engineers"—why are engineers faced with a hostility when the record of improvements in all directions is evident?

Section H/anthropology: Dr M. R. A. Chance, department of ethology at the University of Birmingham. "The social structure of attention and the operation of intelligence". A social structure of attention with a group has recently been discovered revealing an unsuspected bimodality in mental structures.

Section I/biomedical sciences: Dr T. Vickers, senior principal scientific officer, Research Programmes Division, Medical Research Council. "Science and Safety". Recently developed techniques of genetic engineering offer enormous potential for medical and agricultural application, yet there may be serious hazards. The present state of the debate will be assessed.

Section J/psychology: Professor A. Summerfield, professor of psychology, University of London. "Behavioural Toxicity—the psychology of pollution", a discussion of the adverse psychological effects of chemicals absorbed into the body.

Section K/botany: Professor J. G. Hawkes, University of Birmingham. "Genetic Conservation—a world problem". To help combat famine and malnutrition, plant breeders must be continually trying to incorporate genes for higher yields, better quality and greater disease resistance in their new varieties. The spread of standard varieties and the introduction of modern farming techniques is destroying ancient genetic resources and genetic conservationists are seeking ways of collecting and storing them for breeders.

Section K*/forestry: Professor L. Roche, department of forestry and wood science, University College of North Wales. "Forestry and the Community". British forestry in relation to major socio-economic trends within the nation and future world timber supplies.

Section L/education: Mr A. Yates, director, National Foundation for Educational Research in England and Wales. "Improving the quality of Education", the role of research in educational change will be examined in the light of current policies and practices.

Section M/agriculture: Professor K. J. A. Bleasdale, director, National Vegetable Research Station, Wellesbourne. "Britain's Green Revolution", an appraisal of how modern technology is being used in horticulture, mainly in vegetable production.

Section N/sociology: Professor N. Elias, University of Leicester: "A question of time". An attempt to throw light on the relationship between the physical and social sciences by examining the relationship between physical and social time.

Section X/general: Sir Douglas Black, chief scientist, Department of Health and Social Security: "Research and Welfare". What are the requirements of a large government department concerned with welfare, and what are the problems in actually getting the relevant research under way?

And as the 139th president, Sir Andrew Huxley FRS, Royal Society research professor at the University of London, will speak on "Evidence, clues and motive in Science".

BA Annual Meeting, August 31-September 6, 1977.
Please send me further information about the Annual Meeting at Aston as soon as it becomes available.
I am particularly interested in

- ☐ Attending the whole meeting
- ☐ Group visits
- ☐ Scientific lecture programme
- ☐ Scientific and industrial visits
- ☐ Careers events
- ☐ Young people's events

BA ANNUAL MEETING 1977, University of Aston, Freepost*, Birmingham B4.
*No stamp required.

NAME .....

ADDRESS .....

BAYS environment

Two interesting new projects have been added to those undertaken by BAYS (British Association Young Scientists), members in different parts of the country.

Corrosion of metals

The British Steel Corporation has involved three BAYS Branches (Sussex, Crawley and West Wiltshire) in the first stages of a survey on the corrosion of metals. These branches have been chosen for their location. However, in addition to providing data, BAYS members are being asked to comment on research methods being used so that modifications can be made and the survey possibly extended to other BAYS Branches.

The objective is to study the interrelated effects of the frequency of wetting and drying of exposed metal and the deposition of atmospheric contamination. Sets of specimens will be sprayed with distilled water and the rates of corrosion compared with other specimens exposed to the elements. Some will be sprayed with diluted salt solution containing known amounts of sulphate and chloride to compare them to those exposed only to atmospheric contaminants.

Soil fauna in playing fields

In November 1976 a one-day BAYS conference at Rothamsted Experimental Station provided an opportunity for members from nine branches to hear something of the work of the station and to discuss BAYS involvement in collaborative projects. In the event, it was not possible to involve members directly in current work and so the final session was devoted to discussing projects of interest to Rothamsted which BAYS might initiate. It was agreed to begin a study of soil fauna in school playing fields. The Rothamsted scientists noted that there was little data in this area and BAYS could perhaps make a unique contribution.

Its purpose is to investigate the relationship between the age of a piece of grassland and soil fauna. This will provide opportunities for students to map the location of playing fields in any area and to delve into their history.

The BAYS environment project has therefore progressed to a new stage where members are themselves making practical suggestions for scientific study. Since this is the last year of the current grant from the Goldsmith's Company we are now seeking further sources of finance to continue and expand studies.

Science fairs

Since its first event in Manchester in 1961 there have been 84 science and technology fairs held at 49 different centres.

Lord Bowden, writing about the one held in Salford in 1975, looked forward to the work going on in schools and colleges "in the belief that science and technology are matters of great fascination and that the work of the true scientist is as warming to the senses as that of the true artist".

Only one fair committee has in the past concentrated solely on technology (the "Tomorrow's Technologist" series of fairs in Newcastle upon Tyne) but every fair contains a varying proportion of technology exhibits. With the current concern about the lack of effective communication and liaison between industry and education, BA fairs have still much to contribute to increasing the awareness of young people in the significance of technology for our future.

This year has produced an impressive programme of fairs which starts with Dudley from March 21-25 and is followed by Worcester April 1-5, Halifax June 29-July 1, Salford July 4-8, Oxford July 8-12, Canterbury July 12-15, Aston August 31-September 7 (at the Annual Meeting).

Finally, our Northern Ireland branch is this year to include in its junior BA meeting, for the first time, a science and technology fair. This will be in late September on dates still to be announced.

AGE '77 PERSPECTIVES

A thousand people concerned with the elderly will be meeting in Harrogate, on November 1-3 for a three-day conference called "Age Perspectives '77".

The conference, mounted jointly by Age Concern and the BA brings together organisers of volunteer groups in daily contact with old people, and the doctors, scientists and administrators on whom they have to call for information and resources. They will have the opportunity not only to correct their views of each other, but also to question the writers, journalists and broadcasters who mirror the elderly in their work and thereby affect the way the public tend to regard them.

Tasks and Teams

George Foulkes, director of Age Concern Scotland, sees the need to examine the perspectives of each party as a critical next stage in the work. "With 8 million people over retirement age in Britain and with agencies at work with them, ranging from the state itself to local committee of volunteers, it is ripe for an exchange of ideas. Many of the teams at work have a very unbalanced picture of what the others are like".

The way we see each other's functions is always clouded and confused by images from an earlier era. To the general public beside every contemporary social scientist stands his Hollywood equivalent, green smoke pouring from his test-tube, and beside every worker in the voluntary movement stands the ghost of Lady of the manor, distributing bowls of soup to ease her conscience.

Just how far the contemporary ageworker is from such a model is shown by the form and content of the Harrogate conference. A movement of the size of Age Concern, with 1,000 local committees organized in 150 regional, county and metropolitan groups, needs to be concerned not only by the good hearted, but by the well-informed.

Within the next five years, one person in five will be over retirement age—a proportion which means that the elderly are translated from a "them" to an "us". And the movement that caters for them has to calculate the dimensions of the task. If voluntary workers are going to work efficiently, they must hear regularly and clearly from the specialists.

New Light on Old Subjects

In 1975 the first discussions took place on the creation of an Age Action Society was needed to encourage those actively caring for the old and it was intended that many specialised bodies (for example the topic of age was not central) would bring their specialised talents to bear upon the subject of ageing and perhaps throw new light upon it.

The BA responded to this challenge by holding a public one-day symposium on ageing under the chairmanship of Professor Walter Bodmer, FRS, who took up the group of people who constituted the BA committee on social concern and biological advance.* Meetings of the study group continue throughout the year.

But theoretical academic papers are one thing and practical work another: the work of volunteers in local age groups can seem remote, if not irrelevant. Professor Sir Ferguson Anderson, who himself has a foot in each world as professor of geriatric medicine at the University of Glasgow and also, actively, as one of the vice-presidents of Age Concern, says: "The doctors and scientists must know what conditions in the community are like; and the field workers must have access to the latest knowledge and advice. The laboratory of the future is in the community—that is where we are going to get information to help old people into old age."

Care and Commerce

A third group is involved in this coming together of ideas and attitudes—the larger commercial and industrial employers. Company pension and welfare schemes can be considerable and effective and can form part of the vast network supporting the retired, along with provided by the state, the local authorities and the volunteer agencies.

Mr D. G. Rosegood, UK pensions manager of Unilever Ltd, explains his company's policy. Arising from the need to administer pensions for its 22,000 pensioners, his department becomes the natural point for queries, advice and help for the retired: from this evolved the Unilever Pensioners Association which provides a link for old friends, a source of interest and a genuine back-up service for those requiring help on housing, health, income tax, pensions and so on. The association is largely a self-help group run by volunteers (themselves Unilever pensioners), but administered and centered at the centre.

There are similar schemes run in many other big organizations but they all have one thing in common, their interest in their retired workers as people, not as "pensioners".

* Copy of the full report of the day's proceedings is available at £2 post free from the Symposium Secretary, The British Association for the Advancement of Science, 23 Savile Row, London W1X 1AB.

For details of the Harrogate Conference please write to Ursula Laver, The British Association for the Advancement of Science, 23 Savile Row, London W1X 1AB, or telephone 01-734 6010 x 14.



Dr Richard Hoggart.

The uses of education

Richard Hoggart describes his impressions of recent changes in British higher education on returning after a five-year absence

Coming back to British university life after five years away, one's first impression is that the atmosphere is even more depressed than one had expected. Here, as in many other parts of the world, the 1960s saw quite unparalleled growth in university provision. In most places the climate has now changed; with us, it has changed all the more because our economic crisis is particularly severe.

Yet, crisis or not, the economy could not have sustained the 60s rate of growth in this sector for much longer. Growth, yes, but not at that pace; that was a spurt to catch up where we were well behind. By any reasonable international comparison the British universities have had very good special treatment, and they are not being asked to destroy themselves now.

In that heady period from the Robbins Report to the end of the 60s, the British universities grasped some of their new opportunities supremely well. Above all, they did not buy rapid expansion at the cost of that almost unique feature, small-group undergraduate teaching.

They could hardly afford one-to-one or even one-to-two tutorials; but small seminar groups could still be managed, even in the arts departments whose high student: staff ratios reflected the staff-intensive character of the advanced science departments. Hardly a university settled for that mass teaching which went on increasingly in many other countries.

Nor was wastage high. In the late 60s a French university professor—a devoted teacher as well as a fine international scholar—told me he simply had to rely on huge wastage after the first year so that later years could have lecture groups of less than a couple of hundred or so; seminars were out of the question. He wanted to teach well those he finally saw through the degree course and to look especially well after his postgraduates. What the *baccalauréat* results pushed into his university in one year he saw going out—about 40 per cent of them, at least—the next.

In contrast, the British style is typified by the remark of one vice-chancellor—I think it was Eric James—that, since we took such care in selecting for admission and put such stress on what used to be called "pastoral care", it should be a fair assumption that virtually everyone got through in the end.

On the whole that assumption worked. In the full flood of expansion, some students obviously came in who did not quite know what they wanted to do with themselves, who had let themselves slide along through O levels and A levels to university entrance, and were then out of their element. But they were a minority, as no doubt were those characters in Evelyn Waugh's novels of those who slid along from Eton to Oxford with an explicit purpose either.

Overall, there was justification and to spare for more university places; talent was being wasted on a considerable scale through lack of opportunity; expansion was well overdue and most people who now got their chance gained from it, as has society.

Another French professor told me that our greatest problem was not students but staff—the dilution of staff quality by overrapid growth. Undoubtedly there are some people now teaching in universities who were unqualified in the 60s and who would not even be short-listed today. But the fact that we were able to expand so fast, and keep the general level of staffing so high, is the most striking single evidence that we had been artificially restraining much very good talent.

The elaborate and rapid Robbins exercise, with all that it meant in new staffing recruitment of students, teaching and residential buildings, and in all the other manifold details, was carried out by the teachers themselves, backed by intelligent but not numerous—nor always technically-trained—administrative officers.

It is easy to underestimate the nature of such an achievement. It was inspired by the British academics' natural wish not to hand themselves over as an administrative class to people who do not teach, who may never have taught, but who have powers to order and direct the teachers, and who on some foreign campuses rank above "the faculty". One had to go on doing things oneself.

The cost in time and energy was immensely high, sometimes too high. The law of "any more for the undertaker" operates here as elsewhere; those who will, may. Some senior academics could not serve usefully on, say, a buildings committee no matter how hard they tried; some others—though they may be as competent as the next man—would not be willing to serve; they value their time for research too much to do so, or are simply disinclined.

More and more the vice-chancellor and deans therefore know to whom they can turn for conscientious committee work. I do not mean power-seekers or people hoping eventually to become vice-chancellors; I mean people who, though they may not have become internationally famous in their disciplines, had contributed substantially to them, and could have added two or three more valuable books to their scholarly achievements, but who wanted their universities to take proper advantage of expansion and had a particularly strong sense of communal duty.

People such as these served for many hours a week on university and faculty committees right through the 60s. The further books were not written, but the expansion went through in a very human and reasonable way; and that, one must suppose, is their monument. They were the loyal servants of their universities as corporate bodies, and every university has several of them.

It is, however, a pity that here as elsewhere we did not think about the problem rather more. But that is the kind of thinking we do not do very well. We will shoulder, or let other people shoulder, greatly increased burdens of an accustomed kind; we are much less ready to work out solutions to such practical problems.

Of course, there were and are exceptions. The new universities were invited to think radically and some did. Gulbenkian and the *Universities Quarterly* organized a succession of annual conferences on the opportunities before universities; and there are other instances. But all in all, not enough was done to assess the different *kinds* of opportunity now offered.

I have in mind two main areas. First, thinking about the physical and social contexts of the new universities concentrated too narrowly on one form. That model resulted in the planting of scores of the new Baedeker establishments, each set in its two hundred or so acres with its substantial residential provision on the spot.

Agreed, the model has many virtues. Its residential provision and its assumptions about pastoral care are among the most generous of the world. Its great disadvantage, as a national model is its one-sidedness; it lacks variety and inventiveness, in both its social and educational thinking.

Why did no one insist on establishing an inner-city day-student university? Not primarily for cheapness, but because that kind of institution also has much which is distinctive to offer to students, and to the neighbouring community. It would be very interesting to know—if only as an example of how certain social models become dominant—just how the 200-acre, residential-park dream became so persuasive to university planners in the 60s.

University attitudes have not always been like this. In the nineteenth century Ferdinand Oxbridge, and later London University and so the rest, began making provision for the community outside their walls. The achievements of university adult education, inspired by people who were fine scholars and teachers as well as deeply concerned socially, are today insufficiently recognized within most universities themselves.

Too often in the last decade or so, to think about the universities' relations to society was to think chiefly of possible grants from industry or from government agencies. These may be important and valuable, but they are not the heart of the matter. So, between those who wished only to pursue their specialisms and those who saw their links with society in terms of grant-financed work within *predetermined* parameters, a great opportunity went largely by default.

Nor was enough made—at least in the arts and humanities—of the opportunities expansion provided for rethinking either "subjects" or methods of teaching. Little was heard of the value of and need for more part-time evening degree courses. They would have fitted perfectly into a non-residential city university; they could fit well into most universities of any shape or size.

Naturally, there was much thinking about syllabuses in the new universities (less about "subjects" except, notably, at Sussex) and there was some movement in older places; but relatively little in comparison with the opportunities. To their credit most people accepted the case for expansion, even those who would themselves have preferred to remain small. But they too often saw expansion as a matter of simple growth of existing forms and specialisms.

One professor of English (in a new university surprisingly) remarked, a propos a postgraduate centre in contemporary cultural studies which I was setting up within the English department at Birmingham during the early 60s, that he really did not see himself becoming involved with that kind of thing. After all, he said, one needs the full three years to introduce students to "the subject".

His confidence was unassailed. For him, apparently, there was a "subject" as clearly demarcated as the multiplication table (if that still is clearly definable), rather than a contingently-prescribed, historically-defined, artificially-fixed grouping we call "literary studies".

"English" is my own "subject", so I feel all the more strongly about the opportunities most departments missed. Over 70 or 80 years, English literary study in the universities has developed great strengths. It has also been over-circumscribed in both definition and purposes. It has too much isolated literature from other disciplines which could inform understanding of its social and personal contexts and so of "the text itself". That is so. If the mood in many universities today is any guide, we do not live very cheerfully with adversity in *everyday professional life.*

The present cutbacks seem to have encouraged in some people the unexpectancy and *restrictiveness* which are all too near at hand in the British make-up, that disposition to say "no" before one has thought whether "yes" might after all be possible, that "if I give you one, they'll all want one". Bored of Guardians, "more means worse" spirit. It is also the spirit of that assumed law of the non-creation of matter which makes us believe that if one person creates something new then it *must* have been taken from someone else, rather than that growth can make for growth.

We could be using these years more then we seem to be doing for trying out some developments which do not depend on massive new funds: such as making the binary system an example of intellectual and educational cooperation not of separateness, developing part-time degree work which is both cheap and good, linking better with local communities, and promoting a thorough debate about the definitions of subjects and the relevance of syllabuses; in short, thinking again about basic purposes.

Naturally, most of it is serious and carefully considered work; as are, too, the continuing procedures of the Council for National Academic Awards.

But no matter how well some of the polytechnics perform and in no matter what ways, I believe it was wrong for this country to have sought this solution to some of its higher education problems. While I was preparing this article I looked up my own oral evidence to Robbins, back in 1961. I see that I spent much of the time attacking the case for a type of double system which at least one member of the committee seemed to favour; in that period it was the argument that liberal arts colleges could take the pressure of expansion off established universities.

In the binary system we finally achieved something less blatant but no less wrong, wrong above all because it goes too much *with* the social grain, with that inevitable fuss-and-bother and for pecking-orders which is always to be seen or less just below the surface in British society. It was a deliberately divisive act in a habitually divided society.

And what ironic wit invented the phrase "public and private sectors", which is both inaccurate and tendentious? The polytechnics are not "public" in any sense in which is not true of the universities; in some important ways they may be less public.

The universities are no more "private" than the BBC or the Arts Council. They are largely autonomous institutions, established by royal charter to disburse public money for the advancement of knowledge, by research and teaching, in ways which seem right to their corporate professional consciences. If we must have a portmanteau phrase we might say "local autonomy and national"; or, to be as tendentious as is "public and private", we might say: "Council-controlled and autonomous"?

The proof of the contention that the binary system goes too much with the grain of our habitual divisiveness is all around us. Not only in the conversation of senior common rooms, the jealous comparisons of funding, the watchfulness and warliness, the too-easy dismissal of polytechnic initiatives in subjects and methods, the unjust backlilling of CNAA validations; but, above all else, in the inadequate communication and cooperation at all levels between the two sectors.

Lean times do not make for generous impulses. But we should begin to think better or we will let our present situation set us in mean habits which are hard to break when better times do come; or we may be permitted to come "better-to-be" by edict. At that moment the binary system—because of its exact fit with one of our deepest weaknesses—would prove to have been a Trojan horse of immense size.

I have so far had experience of two CNAA boards inquiring into proposed degree courses. Each went into the submissions in depth and at great length. The difficulty in each case was not a lack of serious concern for standards. The difficulty was rather that each area of study is new and so its main lines are still being marked out.

As a result, each committee became an arena for a debate about the nature of the ideal course in the new subject, with the committee members themselves representing different approaches and the proposals at risk of falling through the middle because no reasonable syllabus could be simply a set of compromises without a clearly defined edge.

In each case a good course is likely to emerge, because in the last resort the chairmen and the bulk of the committee members know that people with ideas ought normally to be allowed great scope, even though not everyone would agree with any particular approach. But this kind of searching scrutiny is useful, and would be hard to parallel in some universities when they are considering new course proposals.

According to the national folk-lore, we live well with adversity. Perhaps if the adversity is a cataclysmic war, this is so. If the mood in many universities today is any guide, we do not live very cheerfully with adversity in *everyday professional life.*

The present cutbacks seem to have encouraged in some people the unexpectancy and *restrictiveness* which are all too near at hand in the British make-up, that disposition to say "no" before one has thought whether "yes" might after all be possible, that "if I give you one, they'll all want one". Bored of Guardians, "more means worse" spirit. It is also the spirit of that assumed law of the non-creation of matter which makes us believe that if one person creates something new then it *must* have been taken from someone else, rather than that growth can make for growth.

We could be using these years more then we seem to be doing for trying out some developments which do not depend on massive new funds: such as making the binary system an example of intellectual and educational cooperation not of separateness, developing part-time degree work which is both cheap and good, linking better with local communities, and promoting a thorough debate about the definitions of subjects and the relevance of syllabuses; in short, thinking again about basic purposes.

The author is warden of Goldsmith's College, London. From 1971 to 1976 he was assistant director general of UNESCO responsible for social sciences, human sciences and culture.

NOTICE BOARD

Chairs

Mr Geoffrey Duncan Chisholm, senior urological surgeon at Hammersmith Hospital and senior lecturer in urology in the Royal Postgraduate Medical School, has been appointed to the chair of surgery at Edinburgh University from October 1.

Dr Michael Brooks, of the department of geology, University College, Swansea, has been appointed to the chair and headship of the department of geology at University College, Cardiff.

Dr Brian J. Brinkworth, currently reader in the department of mechanical engineering and energy studies at University College, Cardiff, has been promoted to the newly created chair of energy studies.

Mr William Vaugh, consultant orthopaedic surgeon at Harlow Wood Orthopaedic and Nottingham General Hospitals, has been appointed to the chair of orthopaedic and accident surgery at Nottingham University from April 1.

Dr Leonardo Pompa, lecturer in philosophy, University of Edinburgh, has been appointed to the chair and headship of the department of philosophy, University of Birmingham from October.

Awards

The following appointments to the Harkness fellowships of the Commonwealth Fund 1977 have been made: J. C. Balhurst, hydrology, Univer ity of East Anglia; P. W. C. Calthrop, business administration, Arthur Anderson and Co.; M. D. Damaser, history, Gonville and Caius College, Cambridge; A. C. Davenport, political science, *Far Eastern Economic Review*; P. M. Dawson, Literature, Pitzwilliam College, Cambridge; J. G. Hunter, health services administration, Department of Health and Social Services, Belfast; T. M. Jessell, neuropharmacology, Trinity College, Cambridge; A. R. Louis, public administration, Pendle District Council; R. C. H. Luscombe, international relations, British Army; I. W. Mackenzie, business administration, British Gas Corporation; D. C. Maughan, public administration, H.M. Treasury; R. J. F. Morton, business administration, Clifford; Miss N. C. Nathan, social history, New Hall, Cambridge; M. Ryder, history, Trinity Hall, Cambridge; G. M. Skynoth, Russian poetry, New College, Oxford; D. G. F. Soskin, business administration, Chemical Bank; H. P. T. Stopford, Law, Rand University; D. F. Walker, public administration, *The Times Higher Education Supplement*; A. S. White, journalism, King's College, Cambridge

Appointments

Universities

Cardiff
Director: Professor A. R. Mac (School of Economics).

Edinburgh
Lecturer: J. Herdman (creative ing, English literature); S. A. K son (veterinary anatomy).

Stirling
Promotion to readers: Dr A. Foulkes (German); S. R. Subr (philosophy).

York
Senior visiting fellow: N. W. T (chemistry). Lecturer: Ellie Kennedy (politics).

Noticeboard is compiled by Patricia Santinelli and Pauline Gamble

Forthcoming events

The tenth annual conference of the National Closed Circuit Television Association (NECCTA) will be held at the School of Pharmacy, University of London from March 28 to 31. Topics will include: "Television in education and training" and "Educational Evaluation of CCTV". Enquiries to NECCTA Conference 1977, Conference Secretary, Dover Educational Television Centre, Barton Road, Dover, Kent.

* * *

A symposium on computer assisted learning is being held at the University of Surrey from March 30 to April 1. Papers will be presented on its evaluation and assimilation in the biological, medical, physical and engineering sciences. An exhibition of related materials will be open to the public on Wednesday and Thursday. Further details from Mrs. I. Toye, Information and Training Officer, National Development Programme in Computer Assisted Learning, 37-41 Mortimer Street, London W1N 7RJ.

* * *

"ETIC 77", the annual Educational Technology International Conference of the Association for Programmed Learning and Educational Technology, is being held on March 28 to 31. The theme is the spread of educational technology to teachers and their use of it. Further details from D. P. J. Hill, conference secretary, Institute of Educational Technology, Surrey University, Guildford, Surrey.

Open University programmes March 26 to April 1

Saturday March 26

BBC 2

7.40 Mathematic Matters : design and technology : Pythagoras Identification Codes (T212) : prog 21.
8.05 Making sense of society : Hackney's Design Failures (D101) : prog 7.
8.30 Technology : A foundation course : Mechanics (T100) : prog 61.
8.55 Systems modelling: Linear Programming—A Case Study (T341) : prog 21.
9.20 Topics in pure mathematics : Topology 1 (M302) : prog 7.
9.45 Introduction to engineering mechanics : Velocity and Acceleration Diagrams (T251) : Prog 31.
10.10 An algorithmic approach to computing : What is an Algorithm ? (M251) : prog 21.
10.35 Science : a foundation course : Studying the Small Summer (S100) : prog 25.
11.00 The nature of chemistry Part 2 : Electrochemistry — The Hallmark Molecule (S301) : prog 18.
11.25 Images and information : Journey Into Frequency Space (S194) : prog 21.
11.50 An introduction to the chemistry of carbon compounds : Home Observations (S24 : prog 11.
12.15 Industrial relations : In the Dock (D951) : prog 21.
12.40 Problems of philosophy : The Concept of Mind (D303) : prog 4).
13.05 Linear mathematics : Numerical Mathematics (M208) : prog 7.
13.30 International politics and foreign policy : The Sino-Soviet—Historical and the Actor—Environment (D332) : prog 8).

RADIO 3 (VHF)

6.05 Drama : Music in Medieval Drama (A300 : prog 5).
6.25 Foundations of Education Policy (ED 722 : prog 20).
6.45 Mathematics : a foundation course : Sequences and Limits 1 : edition : prog 7).
7.10 Arts : a foundation course : Decision Making and Literature (A100 : prog 6).
7.35 Science : a foundation course : Review : Supplementary Material (S100 : prog 7).

RADIO 4 (VHF)

Excluding north Scotland and Wales

9.05 Open Forum—8.
9.20 History of architecture and design 1890-1939 : Louis Sullivan (A308) : prog 7).
9.40 The age of revolutions : Napoleon and the Grand Army (A262 : prog 7).
10.00 Personality and learning : Studying learners (E240 : prog 8).
10.20 Twentieth-century poetry : Poetry of the First World War (A305 : prog 5).
10.40 Modern art from 1848 to the present : styles and social implications : Courbet and Realism (A351 : prog 5).
11.00 Decision making in Britain : Who we keep the law (D320 : prog 7).
11.20 Science and belief : from Copernicus to Darwin : The Man-Centred World (A303 Part 2 : prog 5).
11.40 Social psychology : Experiments in Social Psychology (D351 : prog 4).
12.00 Renaissance and Reformation : Erasmo de Morali as a Statesman (A262 : prog 7 :
12.20 Management in education : The Education Part of Schools for Tomorrow (E341 : prog 5).
12.40 The sociological imagination : Two Perspectives in Sociology (D201 : prog 5).
13.00 War and society : The Hundred Years War (A301 : prog 2).
13.20 Curriculum design and development : Education—Whose Responsibility for Self-Esteem—Part 2 (E205 : prog 4).
13.40 Urban development : Design as an Object of Social Scientific Study (D 304 : prog 6).
14.00 The handicapped person in the community : Services and Problems (M 302 : prog 25).
14.20 Patterns of personality : Stepping the Loopholes : (D 302 : prog 6).
14.40 Language and learning : Doctors talking (E262 : prog 3).

RADIO 3 (VHF)

Replacement programmes for north Scotland and Wales

24.00 Twentieth-century poetry : Poetry of the First World War (A305 : prog 5).
00.20 Modern art from 1848 to the present : styles and social implications : Courbet and Realism (A351 : prog 5).
00.40 Science and belief : from Copernicus to Darwin : The Man-Centred World (A303Part 2 : prog 5).

Sunday March 27

BBC 2

7.40 Arts Foundation Course : The Language of Poetry (A100 : prog 6).
8.05 Science Foundation Course : Energy, Elements and Isotopes (S) (S100 : prog 7).
8.30 Mathematics Foundation Course : Describing Data (M100 : prog 6).
8.55 Electromagnetics and Electronics : The Electron Microscope (T262 : prog 5).
9.20 Biological Bases of Behaviour : Brain Structure and Behaviour (S) (S206 : prog 3).
9.45 Computing and Computers : The Years of Digital Computing (PM353 : prog 8).
10.10 The Age of Revolutions : The Marching to the English Cotton Industry 1760-1820 (A362 : prog 3).
10.35 Radioactivity and Learning : Is it Significant ? (E241 : prog 8).
11.00 Mass Communications and Society : Who Controls (DE355 : prog 3).
11.25 Economics and Education Policy : Unearned Income (ED 352 : prog 5).
11.50 The Earth's Physical Resources : North Sea Oil (S205 : prog 8).
12.15 Fundamentals of Human Geography : Economic and Environmental Impacts of Mining (D264 : prog 5).
12.40 Curriculum Design and Development : Tanzania : Education for Self Reliance (E) : (E265 : prog 3).
13.05 An Introduction to Psychology : Thinking Slowly and Creatively (D262 : prog 3).
13.30 History of Mathematics : Root Two—Geometry or Arithmetic ? (A310 : prog 2).

RADIO 3 (VHF)

8.00 English Urban History 1500-1780 : The Demography of pre-Industrial English Towns (A 322 : prog 8).
8.20 Decision Making in British Education Systems : United Kingdom (E241 : prog 11).
8.40 Man-made Futures : Design and Technology, Blueprint Community (A282 : prog 6).
9.00 Making Sense of Society : Feedback (D101 : prog 7).
9.20 Interests of State : Introduction to Administrative Law (A 321 : prog 3).
9.40 Technology : Foundation Course : Mechanics (T100 : prog 9).

RADIO 4 (VHF)

9.10 National Income and Economic Policy : The Multiplier (T282 : prog 7).
9.30 The Early Samuel Chapter and the Rise of Kingship : Reigns of Saul and David : Lament Chapter : Saul at the Head of United Army (A 301 : prog 3).
9.50 International Politics and Foreign Policy : Security and Collective Explorations (D332 : prog 9).
10.10 The Cuban Missile Crisis : Answering a Letter (D 332 : prog 8).

RADIO 3 (VHF)

24.00 The Age of Revolutions : Napoleon and the Grand Army (A362 : prog 7).
00.20 Renaissance and Reformation : Erasmo de Morali as a Statesman (A 262 : prog 7).
00.40 Hegel of Architecture and Design : Theory and Practice : Louis Sullivan (A308 : prog 7).

Monday March 28

BBC 1

6.40 Sesame : Books and paper : Model, Mould and Pattern (E 262 : prog 4).
7.05 National income and economic policy : The Multiplier (T282 : prog 7).
7.30 Social psychology : Cognitive Maps (D351 : prog 1).

BBC 2

6.40 An Algorithmic Approach to Computing : What is an Algorithm ? (M251 : prog 21).
7.05 Urban Woodland Decomposers (S322 : prog 5).
7.30 Art and Environment : Having Ideas for Handling Materials (TAD 205 : prog 4).
16.55 An Introduction to the Chemistry of Carbon Compounds : Home Observations (S24 : prog 4).
17.45 Mathematics : a foundation course : What is a Limit ? (M100 : prog 7).
18.10 Technology : a foundation course : Mechanics (T100 : prog 6).

RADIO 3 (VHF)

9.00 Personality and learning : Reward Preferences (E201 : prog 5).
9.20 The nineteenth-century novel and its contemporaries : Dickens and his contemporaries (A302 : prog 4).
9.40 The development of instruments and their music : The Harpsichord in the Continuo (A301 : prog 4).
17.45 Language and learning : Doctors talking (E262 : prog 3).
18.05 Open Forum—8.
18.20 O.U. Announcements Music-fill.
18.25 Economics and education policy (ED352 : prog 2.
18.45 Public administration : the Core of Government (D 351 : prog 8).
19.10 Making sense of Society : Feedback (D101 : prog 7).
24.00 Decision making in Britain : Who we keep the law ? (D320 : prog 7).
00.20 Management in Education : The Education Part of Schools for Tomorrow (E341 : prog 5).
00.40 War and Society : The Hundred Years War (A301 : prog 2).

Tuesday March 29

BBC 1

6.40 An introduction to materials : Thermal Analysis : (T251 : prog 5).
7.05 Public administration : The Course Planned Income (ED352 : prog 5).
7.30 Business : an interdisciplinary approach : Using the Computer : From Binomial to Normality (MDT241 : prog 4).

BBC 2

6.40 Biological bases of behaviour : Brain Structure and Behaviour (S) (S206 : prog 4).
7.05 Urban education : Mona (E351 : prog 5).
7.30 Language and learning : Hospital Teaching (E262 : prog 3).
16.55 Man-Made Futures : design and technology : Problem Identification Game (T282 : prog 3).
17.20 Physiology of cells and organisms : Transport Kinetics (S321 : prog 4).
17.45 Art and environment : Having Ideas for Handling Materials (TAD205 : prog 5).
18.10 Systems Information : Rumour in Society : Feedback (T341 : prog 5).
18.35 Science : a foundation course : Our Situation (T) : The Event (S100 : prog 8).
19.00 Science : a foundation course : Atoms (Inquiry and Debate) : (S100 : prog 25).

RADIO 4 (VHF)

6.00 An introduction to psychology (D262 : prog 3).
6.20 History of mathematics : An Introduction to the History of the Calculus (A305 : prog 5).
6.40 Patterns of personality : The Psychodynamic Model (D302 : prog 5).
17.45 Little wonder topics and national : Big Science Chapter : Nuclear Physics (S206 : prog 4).
18.05 Public administration : The Core of Government (D351 : prog 8).
18.25 Elements of music : Combination in Musical Tradition (A 282 : prog 5).
18.45 Drama : Music in Medieval Drama (A300 : prog 5).
19.05 Arts : a foundation course : Decision Making and Literature : (A100 : prog 7).
24.00 Social Psychology : Experiments in Social Psychology (D351 : prog 4).
00.20 Urban development : Design as an Object of Social Scientific Study (D304 : prog 6).
00.40 Consulting design and decision making : Consultation—Lobbying for Self-Builders—Part 1 (T282 : prog 3).

Wednesday March 30

BBC 1

6.40 Sesame : Relaxation : An Introduction to Healing (E262 : prog 5).
7.05 Technology for Beginners : Time and Motion (T282 : prog 8).
7.30 Information systems : Rumour in Society (T341 : prog 5).

BBC 2

6.40 Genetics : Catch Your Mutant (S322 : prog 2).
7.05 North Sea Oil (S) : prog 5).
7.30 Biology of architecture and design (D240 : prog 2) : H. M. Schindler : Lloyd's of London (T282 : prog 3).
11.25 Industrial relations : In the Dock (D951 : prog 21).
16.55 Mechanics and applied calculus : Systems of particles (M252 : prog 4).
17.20 Twentieth-century poetry : Edwin Muir (A305 : prog 5).
17.45 Education, economics and politics : The Board (ED 352 : prog 4).
18.10 Modern art from 1848 to the present : Styles and social implications : The Street World of Edvard Munch (A351 : prog 5).
18.35 Arts : a foundation course : The Language of Poetry (A100 : prog 7).

RADIO 3 (VHF)

6.20 People and organisations : The Hospital (D351 : prog 5).
6.40 People and work (DE351 : prog 5).
17.45 Environmental studies : The Pennine North Water and Public Protests (EP322 : prog 2).
18.05 Decision Making in Britain : Parents and Schools (D320 : prog 8).
18.25 Analysis : Limits (M251 : prog 4).
18.45 Biochemistry and inorganic chemistry : History of the Macromolecule (S 205 : prog 2).
19.05 Mathematics : a foundation course : Sequences and Limits 1 (M100 : prog 7).
24.00 The handicapped person in the community : Services and Problems (M 302 : prog 25).
00.20 Patterns of personality : The Psychodynamic Model (D302 : prog 5).
00.40 Language and learning : Doctors talking (E262 : prog 3).

Thursday March 31

BBC 1

6.40 People and Work : Steel (D351 : prog 5).
7.05 Mass Communications and Society : Who Controls (DE355 : prog 3).
7.30 Economics and Education Policy : Unearned Income (ED352 : prog 5).

BBC 2

6.40 Decision Making in British Education Systems : United Kingdom (E241 : prog 11).
7.05 Biochemistry and Statistics : The Structure of Proteins (S205 : prog 3).
7.30 Comparative Government and Politics : Democracy in Britain (D342 : prog 5).
16.55 Social Psychology : Cognitive Maps (D351 : prog 1).
17.20 Science Foundation Course : Energy, Elements and Isotopes (S) (S100 : prog 7).
17.45 The Private Sector of Industry : The Motor Industry : Barriers to Entry (D351 : prog 5).
18.10 Language and Learning : Doctors talking (E262 : prog 3).
18.35 Chemistry and Industry : Petrochemicals : Boom or Bust ? (S206 : prog 2).

RADIO 3 (VHF)

6.00 Environmental Control : Air Pollution (TE322 : prog 5).
6.20 Arts : a foundation course : Arts and Society : Images of Society (A100 : prog 5).
6.40 Environmental Systems : Pollution Physics : Dynamics and Problems (T262 : prog 2).
17.45 Public Administration : The Core of Government (D351 : prog 8).
18.05 Mathematics : a foundation course : Describing Data (M100 : prog 6).
18.25 Science : a foundation course : Review : Supplementary Material (S100 : prog 7).

Replacement programmes for north Scotland and Wales

24.00 People and Organisations : The Hospital (D351 : prog 5).
00.20 Mass Communications and Society : Who Controls (DE355 : prog 3).
00.40 Economics and Education Policy : Unearned Income (ED352 : prog 5).

Friday April 1

BBC 1

6.40 War and Society : The Impact of War on Britain 1914-18 (A301 : prog 3).
7.05 Mathematics and Mechanics : Equations of Motion (M 251 : prog 4).
7.30 Systems Information : Rumour in Society : Feedback (T341 : prog 5).

BBC 2

6.40 Reading Development : Organisation and Structure (E) (E262 : prog 4).
7.05 Economics of Inequality : Education and Inequality (ED 352 : prog 4).
7.30 Physical Chemistry : Equilibrium and Change (S206 : prog 4).
16.55 Mathematics : a foundation course : Describing Data (M100 : prog 6).
17.20 Science : a foundation course : Energy, Elements and Isotopes (S) (S100 : prog 7).
17.45 Public Administration : The Core of Government (D351 : prog 8).
18.10 Social Psychology : Cognitive Maps (D351 : prog 1).
18.35 Physical Chemistry : Equilibrium and Change (S206 : prog 4).

RADIO 3 (VHF)

6.00 Environmental Control : Air Pollution (TE322 : prog 5).
6.20 Arts : a foundation course : Arts and Society : Images of Society (A100 : prog 5).
6.40 Environmental Systems : Pollution Physics : Dynamics and Problems (T262 : prog 2).
17.45 Public Administration : The Core of Government (D351 : prog 8).
18.05 Mathematics : a foundation course : Describing Data (M100 : prog 6).
18.25 Science : a foundation course : Review : Supplementary Material (S100 : prog 7).

Replacement programmes for north Scotland and Wales

24.00 People and Organisations : The Hospital (D351 : prog 5).
00.20 Mass Communications and Society : Who Controls (DE355 : prog 3).
00.40 Economics and Education Policy : Unearned Income (ED352 : prog 5).

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BOOKS

Exploring deprivation

Cycles of Disadvantage
by Michael Rutter and Nicola Madge
Heinemann Educational, £6.50 and £2.50
ISBN 0 435 82851 7 and 82852 5
The Disadvantages of Inequality: a Study of Social Planning
by Richard Berthoud
Macdonald and Jones, £4.95
ISBN 0 354 04047 2



Sir Keith Joseph: disinterring the "problem family".

Shortly before Sir Keith Joseph's very public conversion to the benefits of inequalities determined by the "free" market he tapped another, never very deeply buried, set of British prejudices by disinterring the "problem family". There were, he suggested, a small number of families who remained a burden on the state in a time of rising affluence because their problems reproduced themselves in generation after generation through some cycle of transmitted deprivation. Sir Keith's speeches gave a further boost to the already hot political and academic controversies over poverty and inequality in Britain, and indirectly stimulated the production of these two books.

With the SSRC, the DHSS set up a Joint Working Party on Transmitted Deprivation which commissioned a member, Professor Michael Rutter, to carry out a review of any relevant literature (to declare an interest, after this work had been completed I to became a working party member). In order to avoid some of the more obvious traps set by the notion of deprivation transmitted among a few families, the authors rightly felt they must extend their scope to look at a wider range of disadvantages and inequalities, continuing within as well as between generations; at the possibilities of transmission in classes, groups and areas; and at a range of mechanisms including not only genetics and subcultures but also institutions and discrimination.

They distinguish between the societal determination of degrees of inequality and levels of poverty, which exhibit remarkable continuities, and the factors governing which individuals will come to occupy the lower levels at any point in time, where the picture is much more varied.

Obviously the task of reviewing the literature covering this field was impossible: all human life is there. Moreover the relatively sudden arrival of policy issues such as transmitted deprivation ("battered wives" is another such issue) seems to catch the academic community with their trousers down, so that anyone looking for policy-related evidence must adapt material collected by specialists for other purposes related to other controversies. There are problems of building bridges of common discourse and explanation between the "trained incompetencies" of the separate specialisms of research. How could anyone master and order sufficient material even to describe, let alone contribute to, such a range of controversy?

In fact *Cycles of Disadvantage* is a monumental achievement. The authors attacked their enormous task with remarkable determination, industry and open-mindedness, to produce an invaluable commentary on almost 1,500 very varied references. The material covers fields as disparate as income and housing distribution and policies, intellectual attainment, social mobility, delinquency, subnormality, psychiatric disorder, parenting behaviour, and ethnicity. The discussion incorporates perspectives and insights from specialisms as far apart as genetics and economics at one end of the spectrum to social psychology and labelling theory at the other. Within their chosen limits this review of the literature achieves a degree of comprehensiveness, rigour and clarity of exposition which quite disarms criticism. It also defies summary and abstraction but, to pick only one example, I found the discussion of genetic factors in attainment a remarkably balanced and constructive view of a very hotly controversial area.

In the end the shoddy thinking of the original notion of transmitted deprivation is shot to ribbons, and paradoxically the very thoroughness of this review calls into question the whole enterprise of the working party.

Any limitations of the book stem from three sources which are only partly in the control of the authors. First, as they point out, such a review is dependent on its sources, and the balance of research interest has been biased in particular ways, for example between societal factors in discussions of income and housing distribution, as opposed to individual factors in other areas, such as parenting. (However, this only partly explains the neglect of the situation of women in both these books.)

Second, they have not included discussions of research on *policy-making* (as opposed to policy intervention and outcomes, which are dealt with to some extent). This is understandable given their remit, the status of the working party, the difficulties of research in this area, and the lack of good intervention policies. On the other hand, the useful description of the very patchy pattern of failure and success in Operation Headstart and our own Educational Priority Area (EPA) circles out for some further analysis of what went wrong at the policy-making as well as the implementation level. And although some mention is made of the schools and building societies in transmitting and confirming disadvantage, there is no adequate discussion of the workings of government bureaucracies, such as the School Broadcasting Council or the employment services. Indeed surely, conceptually, there is no limit to the relevance of studies of government policy-making on issues of inequality.

Third, there is the related question of research method. The authors rightly assert that as the problems and solutions of deprivation are multifarious, the search for one correct research approach would be silly. As already noted they underline the bias in particular pieces of research. On the other hand they do not explore sufficiently all the limitations imposed by research methodology.

Partly because of restrictions of space, but also because this is the type of research which predominates in the literature reviewed (and one suspects the type favoured by the authors), many of the findings are in the form of associations between "factors". A typical research question looks at contrasting situations, measures certain inputs and outcomes, applies mathematics to the resulting measurements, and makes informed guesses as to the processes involved. And indeed as the review repeatedly demonstrates, such techniques are powerful and suggestive research tools. Yet the repeated conclusion is that we do not know enough about the social processes which are at work. And although the authors call for more research, on a national and local and individual level (including research on discontinuities in disadvantage) it is not clear what kind of research will bring significant advances in the quality of our understanding.

For, as the authors recognize, the phenomena under discussion are difficult to explore because not only are they "caused" by a multiplicity of "factors" but the whole notion of the separation of factors, such as genes and environment, is suspect. Moreover, in so far as there is "interaction" between factors, it may differ over their range, while the "causes" operate in a kind of regressive chain of "levels". Thus, the relatively poor test scores of West Indian children may be seen in terms of their material situation, the parenting they receive, the kinds of schools they attend, and the tests they undergo, which in turn are all products of wider social and historical processes.

To note in one example of the problems of factorial analysis, *Cycles of Disadvantage* fails to pick up some crucial criticisms of the Plowden research; in operationalizing as "factors" the concepts of parental attitudes and material circumstances the research spuriously built in one of its most widely quoted and influential findings, that "attitudes" may operate independently of "material circumstances". Not to labour the point, it is doubtful whether factor analysis is an adequate tool for the exploration of influences such as social class, political activity, or behaviour in institutions, although one understands the pressures of space and the semantic traps which have led the authors of *Cycles of Disadvantage* to describe research in terms of factors.

The Disadvantages of Inequality is a more personal exploration of the issues of multiple deprivation by an author based in Political and Economic Planning (PEP) and funded by a charitable trust. Unfortunately, by the high standards of insight and comprehensiveness set by the first book, the publishers' claims that Berthoud reviews for the first time the facts on all kinds of disadvantage are made to look rather thin. Although precisely because the trees are much sparser he is able here and there to give a clearer indication of the shape of the wood, and he has provided some clear charts and diagrams of the data.

This book also offers to do more in the way of analysis, by discussing notions of the acceptability of inequality and the unfairness of poverty. The author asserts that it is widely accepted that the range of inequality is too great, and disadvantages stem from that part of inequality which is excessive. He suggests an analogy with a pinball game where the whole group of manual workers ("on a losing wicket" and a "socially weak" group) are at a much greater risk of low income, unemployment, disablement and ill-health; while evidently there is something about those with high status jobs which makes them, or their families, more healthy than those in low status jobs".

However, he finds no space for the "contentious subject of social classes" and declines to speculate on what that "something" is, beyond the assertion that "there is neither purpose nor truth in the suggestion that the rich) are a selfish elite"; they are merely the end of a sort of "chain reaction" of inequality.

He diagnoses the problem of non-manual/manual differences as "hindrances to mobility". The solution is to reduce the power of institutions to discriminate against individuals and to promote freer social mobility for all the lower income groups by "active labour market policies". The evils of inequality should be avoidable "if design looks at contrasting situations, measures certain inputs and outcomes, applies mathematics to the resulting measurements, and makes informed guesses as to the processes involved. And indeed as the review repeatedly demonstrates, such techniques are powerful and suggestive research tools. Yet the repeated conclusion is that we do not know enough about the social processes which are at work. And although the authors call for more research, on a national and local and individual level (including research on discontinuities in disadvantage) it is not clear what kind of research will bring significant advances in the quality of our understanding.

In the end the shoddy thinking of the original notion of transmitted deprivation is shot to ribbons, and paradoxically the very thoroughness of this review calls into question the whole enterprise of the working party.

Any limitations of the book stem

Status in industry

Industry and Inequality: The Achievement Principle in Work and Social Status
by Claus Offe
Edward Arnold, £5.95 and £2.95
ISBN 0 7131 5892 1 and 5893 X

It is good news that the work of the German sociologist Claus Offe is now beginning to appear in English. While this book—a translation of *Leistungsprinzip und industrielle Arbeit*—is an early piece (his doctoral thesis, published in German in 1970) and gives only minor indications of his later thinking on the contemporary state, it is well worth having in English.

Its theme is that changes in the nature of work in modern industry, together with wider social developments, have eroded the social base of the achievement principle, leaving the hierarchy of industrial organization and the division of rewards based on ideological and normative as opposed to objective economic criteria of efficiency.

The change on which he concentrates is that which he calls the shift from continuous to discontinuous status organization. In the former situation the work role in any supervisory function incorporates and transcends the skills practised in the positions beneath it in the hierarchy. In the latter, which Offe sees as increasingly typical in modern industry, the supervisor's work is quite different from that of his subordinates and he does not share their skills. It is therefore difficult to assess the precise difference between his contribution and theirs. Also, the area of discretion open to the subordinate increases and his loyalty has to be secured through normative devices.

The achievement principle is related to the functional theory of social stratification, and Offe uses German and American evidence on the nature of occupational prestige to argue that, as the achievement principle declines in significance so extra-occupational aspects of work positions become symbolic substitutes for assessments of relative worth which can no longer have an objective base.

The implications of this disappearance of the performance criteria are then traced in detail through two central aspects of work: occupational recruitment and mobility and income determination. In both cases he shows how the achievement principle becomes ideological rather than rational, making the possibility that objectively work could be organized on different bases.

The thesis is tightly argued and good use is made of secondary evidence. It needs, however, more direct evidence that the changes in the nature of industrial processes on which the argument rests are as extensive as claimed, and that they do represent an overall tendency as opposed to a series of developments which are contradicted by other, contrary changes. (The absence of such evidence, and the shortness of the book, are reminders of the continuing differences between the requirements of a doctoral thesis in this country and in Germany.)

Offe's use of intellectual traditions is sophisticated and well synthesized—in particular he is able to integrate Marx fruitfully into the corpus of sociological theory. It is therefore unfortunate that a simplistic Marxist introduction has been provided by James Wickham, who has otherwise made such a good job of the translation.

Colin Crouch

Essays on Hayek
EDITED BY FRITZ MACHLUP
Foreword by Professor Milton Friedman
Contributors: William F. Buckley Jr, Gottfried Dietze, Ronald Max Hartwell, Shirley Robin Letwin, Fritz Machlup, George C. Roche III, Arthur Shenfield

'Friedrich Hayek's influence has been tremendous. His work is incorporated in the body of technical economic theory: has had a major influence on economic history, political philosophy and political science: has affected students of the law, of scientific methodology, and even of psychology.' So writes Milton Friedman in his foreword to this volume of essays presented at a special meeting of the Mont Pelerin Society in August 1975, devoted to an appraisal of Hayek's work. The essays deal with a wide range of Professor Hayek's scholarship, and a full bibliography of his work and excerpts from the citation accompanying his receipt of the Nobel prize are appended.
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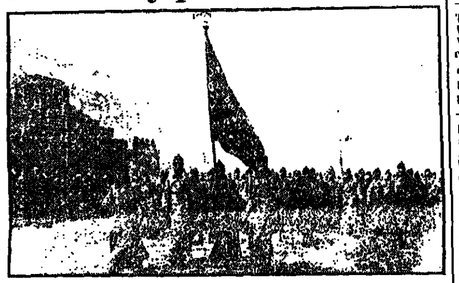
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BOOKS

Revolutionary puzzles

The Russian Revolution: A Study in Mass Mobilisation
by John L. H. Keep
Weidenfeld and Nicolson, £12.50
ISBN 0 297 77210 4



Parade of Red Army troops on the Red Square, November 7, 1925.

Was the October Revolution a mass uprising or merely a coup d'état carried out by a few conspirators? The question has been frequently asked, and has been answered, with passionate conviction, in both senses. But rarely before have we been given so much data as in this book with which to make our own assessment.

Professor Keep's method is to examine closely the various institutions through which mass aspirations for change were mobilized: the workers', peasants' and soldiers' soviets, the trade unions, factory committees, militia detachments, Red Guards, peasant communes and land committees. He devotes a chapter, and often more than a chapter, to each one, describing its structure and purpose, the political movements and leaders that came to dominate it, and the way they modified it.

The result is very different from most accounts of the Russian Revolution: the party in fighting at the top, about which we are already well informed, is filled out with flesh and bone as we see peasants pasturing their cattle on the landlord's meadows and the metal pipe workers of Petrograd trundling an unpopular official out of the works gates in a wheelbarrow. Keep's own conclusion is that the Revolution was *both* a mass rising and a coup d'état, with the Bolsheviks using the dynamics of the former to achieve the latter.

The detailed and simultaneous unravelling of high and low politics does not make for easy reading. A characteristic of the period was the frenetic way in which people who had never known politics in their (or their forebears') lives suddenly set about improvising institutions through which they could express themselves politically. The result was a hotch-potch of ad hoc committees, councils, bureaux, congresses, conferences and what have you, all enshrined in the staid, confident terminology of Western constitutions. At times one has to pinch oneself to retain a sense of reality while reading their impeccably worded resolutions.

Keep is a sober and reliable guide, and keeps a grip both on the real world and on his main themes. He traces the life of workers and peasants from before the world war, showing how their outlook and their demands developed. The urban workers, many of them recent recruits from the countryside and retaining ties there, had been drawn into a way of life, involving harsh work, discipline, inadequate housing, and poverty, not of the drab rural sort, but made sharper by the presence of obvious contrasts in wealth.

Most of them, especially the younger ones, could read and perhaps write (indeed Keep quotes one source which suggests a literacy rate of nearly 80 per cent among workers in 1918), and they were, he suggests, "attaining spontaneously a new awareness of their dignity as human beings, their rights as citizens or consumers, and their latent power to enforce their will", learning from political parties but refusing to be bound by dogma. The war added family disruptions, inflation and shortages to their burden, and brought the urban poor generally, especially the women, on to their side: the overthrow of the Tsar began in the Petrograd food queues on International Women's Day.

Once the old regime was eliminated, the workers tried through their new organizations to win economic security and some measure of control over their own lives—aims which became progressively more difficult to attain as chaos enveloped the country. So the workers' demands became more strident and political, closer to the Bolsheviks, who were able to profit from the dynamic they generated.

In interpreting the peasant movement, Keep takes a strongly neo-Populist and anti-Marxist line, of the kind expounded by Chayanov and recently further developed by Teodor Shanin. He suggests that prewar economic differentiation and conflict within the village was relatively insignificant compared with the forces making for cyclical mobility and solidarity.

The war, he believes, considerably deepened the peasants' traditional distrust of outsiders, especially privileged outsiders. And when those peasants who had been in the army returned home—often still carrying their rifles—then everything was ready for the village commune (or soviet etc), in search of the economic security which had hitherto always eluded peasants, to seize all the local land, whoever it belonged to, divide it up among its own members, and tell the rest of the world to go to hell.

They were in an independent position, because of the enduring strength of cottage industry, which supplied most of their non-agricultural needs, while the towns, by contrast, could now offer them neither consumer goods nor stable money in return for food. Again the Bolsheviks exploited this "peasant revolution", though later on, in government, they had to cope with its consequences; characteristically, they were both more adroit and more ruthless at this than their predecessors.

Although the blurb on the dust jacket asserts that "peasants, and not industrial workers, were the main driving force in the revolutionary process", I find myself wondering if this was not in fact a *soldiers'* revolution more than anything else.

So often the soldiers seem to be the decisive factor: when they turned against the Tsar in February, when they deserted from the front line during the summer and autumn, when they rose in the city garrisons in October (and Keep explicitly plays down the role of the Red Guards—the worker militias—at this point, compared with most earlier historians). At the very least the soldiers were the leaven of the revolution. It is a pity, then, that the book has no special section devoted to them. This is deliberate, since, as Keep notes, Alan Wildman is preparing a monograph on soldiers in the Russian revolution. Still, it is tantalizing to see these ragged figures in their trench coats and puttees appear briefly at the vital moments without being given the detailed and illuminating attention Keep has devoted to the workers and peasants.

However, when an author has already done so much, it is churlish to reproach him with what he did not intend to do. This is an immensely valuable book, erudite and balanced in an area where facts have hitherto been difficult to come by, and partisan opinions unduly thick on the ground. It will figure on all my future Russian Revolution reading lists, and will be particularly appreciated by those students who do not like their history served up in pre-frozen supermarket packets.

Geoffrey A. Hosking

Revised version

The Russian Version of the Second World War: The History of the War as Taught to Soviet Schoolchildren
edited by Graham Lyons
Lea Cooper, £3.95
ISBN 0 85052 2218

It was an excellent idea to produce a short book showing what Soviet schools tell about the Second World War, and Mr Lyons has done his job well.

The first thing that western teachers, and their pupils, still need to know, is the immense scale of the Soviet war effort and the appalling toll of Soviet lives. In the simplest terms, it is the plain truth that the Soviet armed forces made the biggest single contribution to winning the war. Though this is not unknown in Britain, it tends to get lost in histories of the war written in this country, which understandably lay their main emphasis on the British effort. It is also fair to add that knowledge in the Russian story was made difficult until about 10 years ago by lack of published material, and is still impeded by a shortage of British military historians capable of reading sources in Russian.

The second thing that needs to be known is the absolute lack of animosity towards them allies displayed in the official Soviet version of the war. This is something for which there is no parallel on the western side, but western writers have always recognized with gratitude the Soviet achievement even if they have not known enough about it. The Battle of Britain is not mentioned at all. Of the invasion of France in 1944 we are told: "The Anglo-American forces met with practically no opposition from the Italo-Germans, and advanced into the heart of France". At the call of the French Communist Party, an armed rising began in Paris on August 19th. Thirty is not a word of the Allied deliveries of supplies to the Red Army by the Arctic convoys and through Iran. In the Far East, the western defeats by the Japanese in 1942 are briefly listed, but the naval war in the Pacific between 1942 and 1945, the American campaign in the Philippines, and the British campaign in Burma do not seem ever to have taken place.

There are also some notable omissions of political events, the secret additional protocol to the Ribbentrop-Molotov Pact of 23 August, 1939 by which the fifth partition of Poland was delimited, the Molotov-Hitler conversations in Berlin in November, 1940, when Molotov did not reject Hitler's offer of a sphere of influence towards the Persian Gulf in exchange for more in Bulgaria and the Black Sea Straits; and the Soviet-Japanese treaty of April, 1941, by which Stalin diverted Japanese aggression away from his own borders and Far Eastern colonies and towards the United States. The essence of the page 6th that conversations were conducted by the Allies "with the Soviet government and with confidential agents of Hitler" is a grotesque distortion.

Lyons has added special chapters on three especially controversial subjects, on which he rejects Soviet interpretations, presenting what he calls a "summary of Western position". These are the 1939 diplomatic negotiations culminated in the Nazi-Soviet Pact, the Soviet-Finnish War of 1939-40 and the Warsaw Rising of 1944. The second and third of these very well done, and in both cases there is a serious Soviet case to be made and the sources which they have chosen make it rather well.

In the first case, the Soviet arguments are the usual ones: the "western position" seems to me to miss the point. There is of course westerners who believe that the Soviet Union had "to do" with them, but we get with that but what right those who betrayed the Soviet Union at Munich had to expect betrayal, escapes me. The real indictment against the 1939 pact is not Great it is that it damaged the interests of the Soviet Union and gave the green light to Hitler. He next smashed Poland and then smashed France. What the Soviet Union could not do in 1914 to 1918, they had to fight Russia as well as France, they were able to do in 1940. Stalin deprived France of Second Front in 1940, with the result that he had no Second Front to help him when Hitler invaded Russia in 1941. All the hypocritical rhetoric denouncing the failure of the Allies to open the delay in opening a Second Front (of which there are some good examples in the text of this book) cannot wash away the fact that by his robbers' pact with Hitler at Poland's expense, Stalin condemned to death hundreds of thousands of Soviet citizens whose lives could have been spared.

It is to be hoped that this book will be widely used in schools and in undergraduate courses on twentieth-century history.

Hugh Seton-Watson

Literary groups

Russian Modernism: Culture and the Avant-Garde, 1900-1930
edited by G. Gibian and H. W. Tjalsma
Cornell University Press. £8.75
ISBN 0 8014 0842 3

Apart from detailed analyses of poems by Mayakovsky and Kuzmin this collection of essays is not specifically addressed to specialists in Russian, but will also be of value to those whose main interests lie in other areas. Literature and criticism provide the subject matter for all but two of the essays, those two being devoted to art and architecture. For anything like a complete picture of Russian Modernism it would have been necessary, of course, to include some discussion of music. Even so, the volume gains a valuable added breadth from this excursion outside literature.

The inherent danger of a collective enterprise is that in the end the contributions will prove uneasy bedfellows. George Gibian shows his awareness of this in his introduction by pointing out the different ways in which the contributors understand the central term. The essays also vary in scope, some concentrating on particular texts, others delineating general problems or outlining the activities of particular groups. But this variety of approach does no harm; indeed a good deal of reciprocal illumination results from it. It remains a moot point whether Modernism includes Symbolism or not: René Wellek draws a dividing-line at 1910 as accepted date of death of the Russian Symbolist movement, while Patricia Carden argues that the at any rate, Modernism is historically more with Symbolism than with Acmeism, the work of Blok and Bryusov in the earliest years of this century.

The usefulness of the term Modernism is, however, well illustrated by the impressive analysis of Mandelstam and Gennady Shmakov of Kuzmin's long poem of 1927, Forel' Breaking through the Ice. Kuzmin belonged to none of the contemporary groupings of poets in this period, but Mandelstam and Shmakov demonstrate affinities with both many and manner, with currents from Symbolism to Acmeism. At least one can be sure that without signing manifestoes.

This piece on the poet Kuzmin is one of the outstanding high points. Two other contributions that equal Mandelstam and Shmakov's in clarity and insight are those by René Wellek on Edward J. Brown on the unfamiliar topics of Formalism and early Mayakovsky.

Patricia Carden's is the only essay specifically devoted to prose, but it is an interesting argument for the primacy of the concepts of Modernism and ornamentalism seems, however, to fall down on her own contention that the later, more "ornamental" stories of Bely make an enduring contribution to Modernism to Western literature.

J. D. Elsworth

Diplomatic shortcomings

Anglo-Turkish Relations, 1933-1939
by Ludmila Zhivkova
Secker & Warburg, £5.00
ISBN 0 436 59255 X

The author is Minister of Culture in the Bulgarian Government and daughter of the First Secretary of the Bulgarian Communist Party. She is known in the West as an authority on the Thracian art treasures, but her interest in political and economic matters is attested by several earlier works published in Sophia in Bulgarian. It seems likely that this work is an English version of a book published in Bulgarian in 1969 under the title of *Anglo-Turkish Relations on the Eve of the Second World War.*

Dr Zhivkova traces in some detail the course of British diplomatic endeavours to gain Turkey's participation in the war on the Allied side, or failing that, her neutrality. She is probably right in stating that "up to now, there has not been any special historical investigation devoted to Anglo-Turkish relations in the period 1933-39". It could, however, be argued that the matter is now of no particular interest: the shortcomings of Britain's pre-war diplomacy in relation to Eastern Europe are already too well known to the English-speaking world to need further underlining.

Great play is made in the publishers' blurb with the "wide range of hitherto unavailable documents and books" used by Dr Zhivkova. This, however, is only true of Bulgarian archives, which are of little relevance; all the Soviet books and periodicals referred to have always been easily obtainable, while relevant documents in the British Public Record Office have been accessible since 1968. In fact, the documents now selected for publication reveal little of significance beyond the growing awareness of British diplomats that their efforts to secure Turkey's active participation in the impending war were doomed to failure. As things turned out, Turkey's neutrality probably suited the Allies better than her direct involvement.

As might be expected, Dr Zhivkova contrasts Britain's policy unfavourably with that of the Soviet Union, "British imperialism was concerned not so much with the fate and national independence of the small countries of Central and Southeast Europe as with its own colonial interests". The Soviet Union, on the other hand, was consistently fighting "for the interests and independence of the small countries in Southeast Europe". This latter statement is no doubt quite in line with Soviet, and probably with Bulgarian, thinking, but it will hardly be subscribed to elsewhere.

The publication in Britain of a book of this kind could perhaps be regarded as a healthy phenomenon if it presaged the appearance in the Soviet Union (or Bulgaria) of analogous British historical studies, based on contemporary Soviet official archives, on such subjects as Soviet relations with Turkey or Iran between 1945 and 1947. Regrettably, such a possibility seems at present to be remote.

Geoffrey Wheeler

BOOKS

Landscape change

Order upon the Land: The US Rectangular Land Survey and the Upper Mississippi Country
by Hildegard Binder Johnson
Oxford University Press, £7.50
ISBN 019 501912 1

Few demonstrations of man's apparent supremacy over the physical environment are more strident than the vast spread of cultural anonymity and uniformity that is laid as a thin veneer over the richly diverse physical landscapes of modern North America. Generalising historians like W. P. Webb and dramatizing journalists like Alistair Cooke have tended to emphasize the role of particularly striking technological innovations as fundamentally important agents of landscape change. In turn, the claims have been advanced of, for example, the windmill, the Colt .45, the prairie plough and barbed wire.

Now Professor Johnson comes forward as a forceful advocate of the role of the United States rectangular land survey as the underlying catalyst which, in conjunction with the destructive impact of the automobile and the installment plan, has contributed to the creation of a distinctive but essentially impersonal landscape over much of the United States. While a good deal of geographical research focuses on attempting to differentiate among areas, to characterize the personality of regions, Professor Johnson's study constitutes a useful corrective in its endeavour to explain why so many North American landscapes are basically similar and so many of its regions are anonymous.

The United States rectangular survey, which organizes land into six-by-six-mile townships divided into 36 sections of one square mile each, is the cadastral system under which much of the land of the United States was surveyed. In fact, Johnson points out that 69 per cent of the land in 48 states is contiguously covered by the rectangular survey and 9 per cent is intermittently covered in the remaining area, including Alaska.

Originating with the Ordinance of 1785, the federal survey may have been inspired by European precedents as old as centuriation, the Roman system of land division, and the first part of this book investigates the historical origins of the rectangular survey. Although this part contains little that is not to be found in the existing literature on the survey, it does synthesize this literature very effectively and emphasizes the process of colonization and land assignment as one of environmental perception.

Domestication of the American wilderness within the rigid geometry of the rectangular survey during the hundred years or so after 1785 meant that townships were laid out in a way which reflected essentially medieval concepts of distance and certainly pre-industrial levels of transport and agricultural technology. It was becoming anachronistic even as the survey itself was being conducted. At the same time, one principle underlying the survey was much more capitalistic than feudal: common agricultural systems in a European mould were outmoded in North America by the mid-1700s and the desire for assured ownership of separate property parcels required simple and accurate description of landholdings, the Ordinance of 1785 being a plan in support of such possessive individualism.

Having discussed the general character of the survey, Johnson proceeds to a detailed examination of its implementation and functional impact in the Upper Mississippi Hill Country. The emergency of the survey landscape is treated topically, so this book examines in turn township, county and state boundaries; land sales and speculators; the evolution of the checkerboard image of landscape held by contemporaries; the role of agricultural technology and the fencing of plots; the section roadscape; and the emergence of grid-pattern towns. Finally, Johnson endeavours to bring the past alive as part of the present landscape, in an assessment of the persistent influence of the original survey on the modern landscape.

This book, which is not involved to be a comprehensive study in regional historical geography, is instead a sensitive interpretation of one fundamental influence in the historico-geographical development of many North American landscapes. It is without doubt an excellent addition to the already substantial and important Andrew W. Clark series in the historical geography of North America.

Alan R. H. Baker

Elliptic problem

An Introduction to the Mathematical Theory of Finite Elements
by J. T. Oden and J. N. Reddy
Wiley, £17.50
ISBN 0 471 65261 X

The history of mathematics shows that it is by no means unusual for quite advanced mathematical concepts or techniques to be successfully applied to physical problems for years, decades, or even centuries before their fundamental mathematical basis is rigorously analysed and understood. The demands of research in the sciences generate working mathematical solutions to problems for which the criterion of acceptability is in the first instance not rigorous justification but practical result. However, once the techniques are shown to be both successful and of sufficiently wide applicability, they inevitably attract the attention of mathematicians and are incorporated into the general body of mathematical learning.

The mathematics of finite elements provides a modern example of this process of evolution, which occurred over less than two decades. The idea of building up a structure by the fitting together of basic elements comes naturally to the practising engineer. The finite element method is a variational method of approximation which builds up a global solution to a given problem presented in a stated domain from a number of local solutions for geometrically simpler domains—the finite elements—connected together at nodal points. This has the advantage of avoiding those difficulties which often arise in analysis due to unusual geometries and boundary conditions since the interpolation processes used are virtually independent of the geometry of the domain under consideration. As a result of this, functions defined on highly irregular domains can be quite easily interpolated. The method is particularly suitable for the solution of linear elliptic boundary-value problems.

In *An Introduction to the Mathematical Theory of Finite Elements*, the authors provide a systematic and authoritative account of the theory, making it accessible to pure and applied mathematicians having a basic understanding of functional analysis including metric and normed spaces, Lebesgue integration and Hilbert space.

In the first half of the book the authors discuss the mathematical foundations of finite element theory, and in the second half the theory of finite elements as such. Following a thorough discussion of finite element interpolation, earlier material is collected together so as to "recast the elliptic problem in a variational setting firmly rooted in the Hilbert space theory described". This leads to the central issue of the book, namely the theory of finite element approximation of elliptic boundary value problems.

Comprehensive as it undoubtedly is, the book nevertheless does not exhaust the theory. But inclusion of some of those topics omitted, important as they may be, would clearly have made the work of unacceptable length and the authors have very wisely concentrated on presenting a thorough treatment of basic ideas. Those with a more specialist interest for the present will have to be content with published papers.

Graham Flegg

Phases

Three Phases of Matter
by A. J. Walton
McGraw Hill, £15.00
ISBN 0 07 084061 6

The factor that determines the phase—solid, liquid or gas—in which a substance exists is whether the thermal energy of its constituent particles is greater or less than the intermolecular attraction. This is the essential idea of Walton's book. The author's aim is to provide students with a "real feel" for the three phases of matter at the atomic level, keeping mathematics to a minimum.

Throughout the author is successful in his description of phenomena at the particle level, but he frequently loses the reins in his attempt to restrain the level of mathematical complexity. This book has its origin in a first-year undergraduate course and a perusal of the first third of it confirms this.

In contrast, the treatment of Debye's theory of the heat capacity of a solid (albeit simplified) is pretty tough going, while the subtle concepts underlying the electron theories of metals may not be readily assimilated at this stage of academic attainment. The liquid phase is notoriously difficult to treat quantitatively at the atomic level—Walton's approach, using simple models, is involved (he admits it may look formidable) but it is difficult to see alternatives if the book is to live up to its aim and title.

Clearly the range of material that must be included in such a general work is immense and it is not surprising that fluctuations occur in the level of presentation. Written in a racy conversational style which makes for compelling reading, I appreciated his fresh views of familiar territory, such as the section on the Maxwell-Boltzmann distribution. There are numerous worked exercises and each chapter ends with a summary together with a selection of graded problems and answers.

G. A. Cox

Least action

Classical Field Theory
by D. E. Soper
Wiley, £12.90
ISBN 0 471 8136 8 0

Classical Field Theory has developed out of a graduate level course on the subject given by D. E. Soper at Princeton University in 1972. It covers theories of continuum mechanics, electrodynamics and the mechanics of electrically polarized media, and gravity. The special feature of the mathematical presentation is the adoption of a unified formulation based on the principle of least action.

This principle provides a mathematical method that is common to classical mechanics and quantum mechanics; it is perhaps less well known that this is so also for certain other areas in mechanics and physics, including, for example, theories of perfectly elastic solids and perfect (inviscid, non heat-conducting) fluids. However, the principle of least action is based on the concept of a Lagrangian density, and it only plays a central role under conditions of reversibility.

This restriction represents a most serious limitation, so that, for example, theories of plastic solids and viscous heat-conducting fluids cannot be set up according to this particular variational formulation, although extremum principle formulations may still be possible. The usual formulation of theories of continuum mechanics is based upon conservation laws of mass, momentum and energy and constitutive laws, and these lead directly to the field equations expressed as partial differential equations (or, locally, as discontinuity relations) whose structure is the key element to be determined in any particular case.

The purpose of the book is to emphasize the simplicity and the range of applicability of the principle of least action, particularly to physicists; it is attractively written, though in places the style is somewhat informal. However, although the limitations of such an approach are stated clearly, it remains the case that these limitations are severe.

H. G. Hopkins

Plasma theory

Plasma Physics
by E. W. Laing
Sussex University Press, £7.00
ISBN 0 8561 0519

This short book on plasma physics is based squarely on third-year undergraduate and postgraduate courses given by the author who is a reader in physics at the University of Glasgow.

There are many excellent features, particularly those introducing the reader to the more difficult parts of plasma theory. These include a fairly complete account of the MHD stability of a cylindrical plasma column including interchange modes and a derivation from the energy principle of the Suydam stability criterion. Kinetic theory developments from the Liouville theorem, through to the BBGKY hierarchy expansion precede an illuminating discussion on multiple time scales. The dielectric constant for a hot plasma in a uniform magnetic field is derived in a manner following Bernstein. The concept of magnetic surfaces is described by a stream function for an axisymmetric toroidal plasma.

Some of the more basic elements of the subject, such as the relative magnitudes of characteristic lengths and frequencies could have been more clearly expressed. Statements are made and formulae quoted often without explanation. For example, the author states that we would normally require the number of particles in a Debye sphere to be a large number in order to have a plasma at all. But he does not explain why.

Subjects are presented in a curious order. For example, stability is considered before magnetic confinement, and the moments of the Boltzmann equations are derived after the fluid equations have been used. Ohm's law is not derived and is only quoted in full near the end of the book (without defining the tensor resistivity). Earlier the electron pressure gradient was replaced by a density gradient, and throughout the book the Hall effect is largely neglected. By not deriving such fluid equations formally the author also misses an opportunity for showing when guiding centre theory and fluid theory are equivalent.

For the reader who wants a broader view of the applications and methods of plasma physics there are introductory chapters on astrophysical problems, laser fusion (superdense plasma), and on computational methods for modelling plasmas. In the last chapter the basic ideas of implicit and explicit numerical schemes, numerical stability and the treatment of advection, diffusion, and particle-cell schemes are described. These chapters could trigger the enthusiasm of a student to pursue the topics in more detail, but occasionally the reader is confronted with a list of "blackboard" headings with no explanation.

Important subjects omitted from the book include high frequency cold plasma waves, bremsstrahlung and other radiation processes, ionisation and other atomic processes, transport theory, ion acoustic and other instabilities, and diagnostics including scattering of radiation.

However, in a book of only modest length many elements of plasma theory are covered well, and it will be a useful addition to those requiring a first textbook.

M. G. Haines



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BOOKS

Disciples and adversaries

Bergson and his Influence: A Reassessment
by A. E. Pilkington
Cambridge University Press, £9.00
ISBN 0 521 20971 4

Dr Pilkington's study, *Bergson and his Influence*, serves three distinct purposes. It offers a fresh account of Bergson's philosophy, it reintroduces the reader to the basic concepts of the thought of four of his contemporaries — Péguy, Valéry, Proust, and Benda—and more significantly, it proposes a new evaluation of the boundaries within which intellectual influence can legitimately be detected. This last aspect, a by-product so to speak of the comparative approach, gives the book its distinctive interest.

Pilkington's stated aim is to get beyond admitting the existence of a "*Bergsonisme latent*" to establishing concrete relationships. The writers mentioned were chosen perhaps for "formal" reasons. They are symmetrically related: Péguy the disciple, Benda the adversary, linked on a contrasting basis; Valéry and Proust, both disclaiming direct influence. This is aesthetically satisfying. Yet would not Bergson's cause have been better served had his influence been shown to operate on genuine philosophers? Would not his fame have appeared more enduring if Pilkington had chosen more recent "witnesses"? Bachelard and Sartre spring to mind. Sartre, admittedly, is effectively introduced in the conclusion. Not so Bachelard. Yet in *La Dialectique de la durée*, he had written: "*Etablir métaphysiquement—contre la thèse bergsonienne de la continuité—l'existence de ces lacunes devait être notre première tâche. Il nous a donc fallu discuter la fameuse dissertation bergsonienne sur l'idée de néant . . .*" (VII). Duration and inexistence: Bachelard's filiation is clear; his opposition to Bergson more meaningful than Benda's misrepresentations.

However, within the *literary* confines outlined by the four writers, Pilkington has admirably achieved his aim, presenting Bergson's theses and then following their impact. Impact is the operative word, for not even Péguy the disciple can be said to *reflect* the master's thought. Rather does he react to it with a "*résonance nouvelle*" to such an extent that his agreement with Bergson (mistrust of language, insistence on the diversity of lived experience, the primacy of the individual) turns eventually to deep divergence. There was from the start a change of register, Bergson's pure speculation on a psychological plane being applied by Péguy to a historical context, but to this succeeds an outright rejection of Bergson's later method when in *L'Evolution Créatrice* verbal explanations replace the previous recourse to experience. The intellectual relationship labelled "influence" is complex indeed: transference involves transformation, allegiance to the early Bergson becomes rebellion. And so with this first most promising witness the case is already lost: Bergson's thought has triggered reactions, consonant and divergent: it has not really moulded, influenced.

With Valéry, the concept of influence suffers a new blow. The poet's admitted ignorance of Bergson's main works makes it paradoxical to infer influence. Yet Pilkington brings to light remarkable similarities in Valéry's view of language as the source of pseudo-problems, in his belief concerning the personal quality of experience. The confrontation of relevant texts proclaims these affinities. No doubt such texts speak for themselves, but do they speak the language of influence or of coincidence? If the reader's interest is focused on the former, he can only regret that the concept of intellectual influence has again been endangered.

The next example, Proust, does not restore the validity of the concept of influence. A better case, however, could have been made here on behalf of similarities. Among other points Pilkington notes the parallel distinction in Bergson and Proust between lived and measured time, their common attitude to language as separating us from the real world and the true self, but should he affirm a total divergence between Bergson's pure memory and Proust's *souvenir involontaire*? Pilkington bases his contention on the celebrated *madeleine* incident. Far from being a Bergsonian spontaneous recall, he argues, it is a past painstakingly revived. Quite so. But then the madeleine is not, in a sense, an authentic Proustian *souvenir involontaire* since it fails to bring about the hero's faith in his literary vocation. Such an assurance will come with the wave of involuntary recalls at the end of the novel. Of these, two at least, connected with the starched napkin and the drainpipe, display the spontaneity, indeed the hallucinatory quality of Bergson's *souvenir pur*.

If greater similarity should have been noted here, a deeper divergence is omitted elsewhere: has Proust benefited from Bergson's view of continuity to the extent of repudiating psychological association? Re-reading *Un Amour de Swann* one might doubt it. However, there emerges from the comparison with Proust so much that is illuminating—on art and language, habit, humour—that indeed more praise is deserved than strictures.

With Benda, influence is dealt a final blow. He had close knowledge of Bergson's works: hence the possibility of genuine links. But Benda deliberately misunderstands key concepts or transposes Bergsonism "from the level of explanation to that of moral exhortation". We have come full circle: Benda the adversary, the Péguy the disciple, testifies to the impact of Bergson's thought by adapting or distorting it.

Pilkington's conclusion opens so many new avenues that it could be expanded into a second volume: a tribute surely to Bergson's far-reaching theses but also to Pilkington's mastery of his subject.

Ninette Bailey



Lacquer tray depicting samurai, Yoshitsune fighting the mythological monk, Benkei. From The Samurai by S. R. Turnbull, Osprey, £8.50

Politics rejected

Epicurean Political Philosophy: The De rerum natura of Lucretius
by James H. Nichols, Jr
Cornell University Press, £8.05
ISBN 0 8014 0993 4

Nichols's plan is to study Epicurus's political philosophy as it is transmitted to us in the Latin hexameters of his devotee Lucretius. The difficulty about this is that there is not much *political* philosophy in either of them. If you want to live in peace and enjoy your life, you must be free from fear (that includes superstition), and you must be free from ambition (that includes political ambition): Epicurean political philosophy is a rejection of politics, and not worth writing a book about.

Nichols attempts to surmount this difficulty by writing three chapters summarizing Lucretius's poem on the nature of the universe, and one on the political philosophy of Hobbes, Montesquieu and Rousseau. This is all very well. Epicureanism is a pure and fascinating philosophy. Lucretius is a great poet, and Nichols gives a sensible survey of his thought (except for his attempt to resuscitate the old idea that Lucretius was an atheist), but he still fails to produce a book to match his title.

True, a short passage at the end of Lucretius's fifth book (the imaginative reconstruction of the development of human society in three phases, the primitive, the political, and the political in its last phase, for instance, all discovery of fire and the rise of language, "kings began to build cities for their own protection, distributed cattle and land to those who were beautiful and strong or intelligent. Then wealth was discovered . . ." and readers of *1984* will be able to finish the sentence for themselves. This is thin.

Just as the first part of the book has shown that there are perfectly adequate mechanistic explanations of the origins of the earth and of celestial phenomena, so no need to invoke divine control, the second part provides anthropocentric explanations of the origin and history of human society: no need to say that the gods have given men language and fire and civilization. Lucretius advances this argument with political prudery only to add that there is no need for us to be worried by superstitious hypocrites.

Political philosophers as such will learn nothing from this book; Lucretius as such they would be well advised to get back as soon as possible to Epicurus, their Nozick, and their Carnap.

David W

Hidden greatness

John Keble: Priest, Professor and Poet
by Brian W. Martin
Croom Helm, £6.50
ISBN 0 85664 381 5

There are several reasons why Keble remains a difficult man to focus clearly. The most unfortunate is in his original biographer, J. T. Coleridge, an able man, but old and tired when he wrote.

Then, in a century in which all the great men were constantly changing and developing, he remains a static point. He was the only one of the leaders of the Oxford Movement who had a strong High Church background. What for Newman and Hurrell Froude was a voyage of discovery into the uncharted riches of Catholic theology was for Keble simply the old, familiar thing. For Keble the Bible, the Fathers, the Caroline Divines and the Anglican Church in his own time were all saying the same thing.

He always underrated the strength of the Protestant tradition in Anglicanism. He treated the problem, so intractable from an Anglican point of view, of the Roman Church with a kind of vague petulance. He spoke vaguely of "the Fathers" and Rome's "errors", without attempting to develop any theory to justify (on Catholic principles too!) the right of an offshore island, its King and lay Parliament to give laws to the Catholic world. He never really understood Newman's remorseless logic. He never faced the vital question, which every Catholic-minded Anglican must answer, or submit to the charge of unthinking superficiality:

"How can you reconcile the 39 Articles with Catholic Doctrine?" What would the Fathers have said about the proposition that good works performed without faith have the nature of sin, or the idea that secular princes have the right to veto the Church from holding a General Council? He had been born into the Church of England and that was enough for him.

Now all this suggests a rather trivial, conventional figure. And Keble was not; it is one of the merits of Mr Martin's useful, sensitive book that it shows him as a man of the intensest religious conviction. Hence his characteristic synthesis of the ordinary insights of the Romantic poets with extreme social and political conservatism. He was perfectly sincere when he wrote that Homer but all true poets must be on the party in a war which holds it a sacrilege to die for what is peaceful, or to try to profit in mere pursuit of novelty; and sanctioned by ancient usage and religion". He disliked poetry that was on passionate even more than poetry that was subversive. His remarks both Dryden and Byron are perversely, but of the two essays I prefer Byron.

Yet another reason why Keble's essence is hard to grasp is that he is being the wrong approaches to him. Newman reverenced more than what he was. A man of Keble's talent, in a way, a great man. But he has to be taken partly on faith. Martin grapples valiantly, and with fair success, with the problem of making this hidden genius explicit. He makes good use of Keble's lectures on poetry, which are extraordinarily successful in the way they try to domesticate the strangeness of Wordsworth and the other romantic poets in a stricter and stricter way. And he gives a perceptive account of the poetry of *The Christian Year* and a sound analysis of its literary sources.

Martin seems more at home with the literary than with the religious aspect of his subject, though he clearly has a personal sympathy for both. The great virtue of his book is that he is concerned to understand Keble in terms of his own time and background, and his reading and his own thoughts. There is no attempt to explain Keble away by some modish theory; and Martin wishes the same could be said of current books about other Victorians.

A. O. J. Cock

Origins of a myth

John Arbuthnot: The History of John Bull
edited by A. W. Bower and R. E. Erickson
Clarendon Press: Oxford University Press, £15.00
ISBN 0 19 812719 7

The History of John Bull belongs to that special kind of literature whose influence has been much greater than people's readiness to read it, or than any distinction that might reasonably be claimed for the quality of its writing. It is possibly the least read of any work that ever created a potent national mythology. Everyone knows what John Bull stands for, honest, plain-dealing, unpredictable, courageous, sturdily independent Englishman, rightly contemptuous of foreigners with their bogus (mostly French) refinements and their devious ways. The stereotype was not new, although it had an intensified currency in a particularly xenophobic phase of English history. But few realize that the myth is officially embodied, at least to the extent of getting its name from it, in a laboured political allegory of 1712, now deeply buried in topicalities of the moment, written in support of the Peace of Utrecht.

Paradoxically, this was a Tory accommodation with France (personified as Lewis Baboon, i.e. Bourbon). The Whigs opposed it with nationalist fervour, on the grounds that it threw away the advantages of Marlborough's victories, and also that it was disloyal to England's allies, chiefly the Dutch (Frog in the allegory is Dutch, not French). Arbuthnot, like his friend and fellow Tory-apologist Swift, exposes the Dutch as themselves disloyal, and gives a caricature of them as shifty, unscrupulous and meanly calculating. There is, however, no whitewashing of England's new-found friend. The portrait of Bubosa is seasoned with homespun distaste even as the practical value of peace with him is asserted. Bull asks him for guarantees that he will keep their bargain, and is reassured thus: "I know of no particular Mark of Veracity . . . but Interest: and it is manifestly mine not to deceive you at this time". We sense the unborn ghost of General de Gaulle stirring from the otherwise limp prose.

Some of the sketches of national characters are done with a graphic grotesquerie, and there is some good dialogue in Scots when sister Peg (Scotland) is on the scene. The Dissenting brother, Jack, imported from the *Tale of a Tub*, has some of the faraway vitality of his Swiftian original, and the large sections of the work which overtly imitate the *Tale* do so with real, if sub-Swiftian, force. But for the most part, *John Bull* remains tedious, even after all the jokes have been explained and the topical allusions glossed (as they are, at long last, in this good edition). The thickly encrusted topicalities fail to transcend their immediate purposes and to turn into timeless satiric fictions, as do those of *Gulliver's Travels* or the *Dunciad*. The work also lacks that easy geniality and witty brilliance for which Arbuthnot was noted as a person. Macaulay called it "the most ingenious and humorous political satire extant in our language", but this is not the only occasion when that self-important phrase-maker became intoxicated to the point of dottiness by his enthusiasm of the moment.

This is not to say that this edition is unwelcome. The value to political historians of its accurate text and detailed commentary will, I suspect, be very great. Students of Swift will learn much from it also. The editors record not only the close relations with the earlier *Tale of a Tub*, but also with Swift's more immediately contemporaneous Tory tracts: they do not concern themselves with the bearing of *John Bull* on Swift's later writings, especially the *Drapier's Letters*, some of whose satiric techniques it anticipates, but that is outside their brief.

The five pamphlets have indeed sometimes been thought to be by Swift, and were included in some editions of Swift's works. They were collected in the second volume of the *Pope/Swift Miscellanies* in 1727, with considerable modifications and with notes in which Arbuthnot may have had no part, and some of which were probably by Pope. They merged naturally into the tangled net of Scriblerian publication, with all the elements of multiple authorship (real or rumoured) which this implies. The editors discuss this skilfully, and ascribe the authorship of the 1712 texts firmly to Arbuthnot; while not ruling out the possibility of some collaboration by other members of the Tory circle. Their text is based on the first editions, but the 1727 material is fully recorded.

To both the introduction and the notes, the editors are highly informative and helpful. There are a few minor slips or omissions. "Publisher" does *not* mean publisher (p lxxviii). The words "nominal" and "real" (pp 28, 159n) probably carry an allusion to Swift's *Argument Against Abolishing Christianity*, published the previous year, and there are some misprints. But these are small things.

C. J. Rawson

An old quarrel

Ballad Studies
edited by E. B. Lyle
D. S. Brewer, £3.50
ISBN 0 85991 020 2

This collection of specialist articles opens with a thoughtful reconsideration of an old quarrel: were the ballads independent productions, whether of "the folk" or individuals, or were they degenerations of the castle-haunting minstrels' long narrative romances? Rygard's sensible conclusion—which the history of later balladry would certainly support—is that most were of the first kind, some of the second. John Sinclair concludes the volume with an account of a fascinating experiment involving Keats's *La Belle Dame Sans Merci* and six students, revealing how rapidly orally conveyed texts will change and on what principles they do so (linguistic *analogy*, *analogy*, *maximization* of archaic language, *misunderstanding*, and *approximation* to forgotten detail).

In between these pieces come recondite studies of highly specific matters. The only one likely to appeal also to the non-expert is David Buchan's "History and Harlaw", a nice example of two-way detective work. On the one hand, he reconciles the apparent inconsistencies of different versions of the ballad in the light of a reconstruction of the battle of Harlaw (1411) and thus partly confutes Child's thesis on "historical" ballads (paradoxically, on Buchan's showing it is the very *inconsistencies* that show the ballad to be historically correct). On the other hand, he uses the ballad variations to reconstruct the battle more thoroughly than any historian has. It sounds like logical legerdemain, but in fact is pretty convincing.

Allan Rodway

Reviewers

Among this week's reviewers:
Dr Ninette Bailey is senior lecturer in French at Birkbeck College;
A. O. J. Cockshut is G. M. Young lecturer in nineteenth-century English literature at Oxford. His books include Anglican Attitudes;
Professor H. G. Hopkins is in the department of mathematics at UMIST. He is editor of The Journal of Mechanics;
Geoffrey A. Hosking is director of Russian studies at the University of Essex and author of The Russian Constitutional Experiment;
Dennis Marsden is senior lecturer in the sociology department of Essex University and author of Mothers Alone: Poverty and the Fatherless Family.
C. J. Rawson is professor of English at Warwick University and has published extensively on eighteenth-century English literature;
Professor Hugh Seton-Watson is head of the history department of the School of Slavonic and East European Studies. His latest book is The Russian Empire 1801-1917;
Lieutenant-Colonel G. E. Wheeler was director of the Central Asian Research Centre 1953-68. He has written a number of books on Soviet Asia.

A literary artist

John Stuart Mill
by R. J. Halliday
Allen & Unwin, £5.95 and £2.95
ISBN 0 04 320113 X and 320114 8
John Stuart Mill: A Mind at Large
by Eugene August
Vision Press, £6.40
ISBN 0 85478 443 8

Ursiko Gertrude Himmelfarb's recent book on Mill's *Liberty*, both August and Halliday argue for the *unity* of Mill's thought.

August addresses himself to the general reader and although he offers no new interpretation of any of the major works he draws our attention to a side of Mill which is seldom discussed, namely, that he was "besides being an intellectual giant . . . an impressive literary artist as well". His principal writings manifest an imaginative aspect; an aesthetic concern for balanced narrative matching the precision of a logical mind. Hence, for instance, *On Liberty* is exhibited as a drama depicting the clash of opposing forces; of society against the individual and liberty against power. The struggle between individual and society dominates the first chapter of Mill's essay whereas in the second the conflict between competing opinions holds the centre of the stage; and in the third a contrast is drawn between "vegetal movement and growth" as opposed to "painful restriction . . . and atrophy"—"the wildness of Niagara is set against the sluggishness of a Dutch canal".

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Unlike Gertrude Himmelfarb's recent book on Mill's *Liberty*, both August and Halliday argue for the *unity* of Mill's thought.

August addresses himself to the general reader and although he offers no new interpretation of any of the major works he draws our attention to a side of Mill which is seldom discussed, namely, that he was "besides being an intellectual giant . . . an impressive literary artist as well". His principal writings manifest an imaginative aspect; an aesthetic concern for balanced narrative matching the precision of a logical mind. Hence, for instance, *On Liberty* is exhibited as a drama depicting the clash of opposing forces; of society against the individual and liberty against power. The struggle between individual and society dominates the first chapter of Mill's essay whereas in the second the conflict between competing opinions holds the centre of the stage; and in the third a contrast is drawn between "vegetal movement and growth" as opposed to "painful restriction . . . and atrophy"—"the wildness of Niagara is set against the sluggishness of a Dutch canal".

As a general survey of Mill's thought, however, August's book has nothing to recommend it over Alan Ryan's recent study, nor indeed over Halliday's. Moreover, Halliday has an interpretative theme which serves not only to see Mill in the round but also contributes to the debate over how to construe particular works like the *Liberty* or the *Logic* and whether we should consider Mill to have been a "socialist".

The turning point in Mill's intellectual development for Halliday, as for many other commentators, is of course the "mental crisis" of 1826. Thereafter we can identify a "permanent revolution in Mill's thinking . . . the changes were wholesale and drastic". The ensuing "intellectual reconstruction" involved a commitment to "self-culture" which stood at the centre of a new or revised utilitarianism. Although Mill came to think later that his reaction against his inherited opinions had been excessive, Halliday is sure that there was "no return to Benthamism worth speaking of".

Naturally, this is but a bare outline sketch of a thesis developed in much detail, for despite some remarks in his introductory chapter on the standards of interpretation employed by political theorists Halliday recognizes the need to support his account by a careful appeal to the texts and, in his case, a wide range of secondary sources. He is no less aware than other Mill scholars that the texts, or certain passages in them, have generated long-standing controversies. Even so there are limits beyond which no interpreter can go and though there are times when I feel reluctant to follow him it cannot be charged that he ever loses contact with the writings he seeks to interpret.

It is all the more surprising, therefore, that in his brief pronouncement on method he seems to come perilously near to disclaiming the necessity to maintain this contact and to advocate a Feyerabendian position of "anything goes". Political theorists, he says, "work with loose and negotiable sets of concerns, making use of many different and varied skills". Fair enough, if somewhat vague. But when he goes on to say that "all interpretation is selective, and all selection is arbitrary and partial", the "arbitrary" bothers me a lot. Does he mean to countenance an interpretation that ignores the impact of the "mental crisis" and rests entirely on those passages which suggest a continuing allegiance to Benthamism? Or an account of the final book of the *Logic* that failed to appreciate the effect of Macaulay's criticism of his father? (A matter on the importance of which there is here, so it seems to me, insufficient emphasis.)

There are, then, "facts", to put it crudely, relating to these and many other issues to do with Mill's philosophy which no interpreter should overlook and it is one of the merits of Halliday's scholarly and suggestive study that one's reservations rarely stem from this source.

As to these reservations, only one or two can be mentioned here. Halliday wishes for the most part to play down the persistence of the Benthamite influence, hence an emphasis on Mill's renunciation of positivism. Yet he has to admit—something as "arbitrary" commentator would simply brush aside—that in the *Logic* there are times when positivism clearly asserts itself. The *Logic* went through several editions, testifying to the strength of the early beliefs which continued to mix uneasily with acquired opinions. In describing Mill as both a romantic and a utilitarian Halliday points to the conflict, save that his account of the revised utilitarianism incorporates the romantic element. The urge to present Mill's philosophy as a consistent whole, despite constant talk of eclecticism and pragmatism, gets in the way of recognizing or giving sufficient emphasis to these tensions. Furthermore in connexion with *On Liberty*, where "self-culture" receives its most notable expression, may it not be that Benthamism" had a greater role to play in determining some of its major features than Halliday is prepared to allow?

John C. Rees

Against the modern tide

The Grammar of the Real: Selected Prose 1959-1974
by James McAuley
Oxford University Press, £7.50
ISBN 0 19 550481 X

Reading through this collection of essays published just before the untimely death this year of Australian poet and critic James McAuley, one is at first impressed by the range of his interests. There are careful evaluations of Australian poets; there are attempts to define the principles of metre and diction in verse; there are comparative studies of Spenser and Eliot, of Milton and Dryden, of Wordsworth and Crabbe; there are essays on politics, sex and love in English and Russian literature, autobiographical accounts of the author's encounter with natives and missionaries in New Guinea (the latter contributing to his conversion to Catholicism), and, finally, there is new poetic work in the form of translations of the German poets Albrecht Haushofer and Georg Trakl.

Of these essays, the four on Australian poets (Shaw Neilson, Judith Wright, Kenneth Slessor and Rosemary Dobson) are the finest. In his discussion of Shaw Neilson, McAuley's understanding of the special problems of the poet in Australia, his concern with the craft of poetry and particularly with matching this hidden genius with Neilson's religious temper, his awareness of the Australian critical tradition and of the readership of *Australian Literary Studies* (where Wordsworth and the other romantic poets in a stricter and stricter way. And he gives a perceptive account of the poetry of *The Christian Year* and a sound analysis of its literary sources.

Martin seems more at home with the literary than with the religious aspect of his subject, though he clearly has a personal sympathy for both. The great virtue of his book is that he is concerned to understand Keble in terms of his own time and background, and his reading and his own thoughts. There is no attempt to explain Keble away by some modish theory; and Martin wishes the same could be said of current books about other Victorians.

A. O. J. Cock

Origins of a myth

John Arbuthnot: The History of John Bull
edited by A. W. Bower and R. E. Erickson
Clarendon Press: Oxford University Press, £15.00
ISBN 0 19 812719 7

The History of John Bull belongs to that special kind of literature whose influence has been much greater than people's readiness to read it, or than any distinction that might reasonably be claimed for the quality of its writing. It is possibly the least read of any work that ever created a potent national mythology. Everyone knows what John Bull stands for, honest, plain-dealing, unpredictable, courageous, sturdily independent Englishman, rightly contemptuous of foreigners with their bogus (mostly French) refinements and their devious ways. The stereotype was not new, although it had an intensified currency in a particularly xenophobic phase of English history. But few realize that the myth is officially embodied, at least to the extent of getting its name from it, in a laboured political allegory of 1712, now deeply buried in topicalities of the moment, written in support of the Peace of Utrecht.

Paradoxically, this was a Tory accommodation with France (personified as Lewis Baboon, i.e. Bourbon). The Whigs opposed it with nationalist fervour, on the grounds that it threw away the advantages of Marlborough's victories, and also that it was disloyal to England's allies, chiefly the Dutch (Frog in the allegory is Dutch, not French). Arbuthnot, like his friend and fellow Tory-apologist Swift, exposes the Dutch as themselves disloyal, and gives a caricature of them as shifty, unscrupulous and meanly calculating. There is, however, no whitewashing of England's new-found friend. The portrait of Bubosa is seasoned with homespun distaste even as the practical value of peace with him is asserted. Bull asks him for guarantees that he will keep their bargain, and is reassured thus: "I know of no particular Mark of Veracity . . . but Interest: and it is manifestly mine not to deceive you at this time". We sense the unborn ghost of General de Gaulle stirring from the otherwise limp prose.

Some of the sketches of national characters are done with a graphic grotesquerie, and there is some good dialogue in Scots when sister Peg (Scotland) is on the scene. The Dissenting brother, Jack, imported from the *Tale of a Tub*, has some of the faraway vitality of his Swiftian original, and the large sections of the work which overtly imitate the *Tale* do so with real, if sub-Swiftian, force. But for the most part, *John Bull* remains tedious, even after all the jokes have been explained and the topical allusions glossed (as they are, at long last, in this good edition). The thickly encrusted topicalities fail to transcend their immediate purposes and to turn into timeless satiric fictions, as do those of *Gulliver's Travels* or the *Dunciad*. The work also lacks that easy geniality and witty brilliance for which Arbuthnot was noted as a person. Macaulay called it "the most ingenious and humorous political satire extant in our language", but this is not the only occasion when that self-important phrase-maker became intoxicated to the point of dottiness by his enthusiasm of the moment.

This is not to say that this edition is unwelcome. The value to political historians of its accurate text and detailed commentary will, I suspect, be very great. Students of Swift will learn much from it also. The editors record not only the close relations with the earlier *Tale of a Tub*, but also with Swift's more immediately contemporaneous Tory tracts: they do not concern themselves with the bearing of *John Bull* on Swift's later writings, especially the *Drapier's Letters*, some of whose satiric techniques it anticipates, but that is outside their brief.

The five pamphlets have indeed sometimes been thought to be by Swift, and were included in some editions of Swift's works. They were collected in the second volume of the *Pope/Swift Miscellanies* in 1727, with considerable modifications and with notes in which Arbuthnot may have had no part, and some of which were probably by Pope. They merged naturally into the tangled net of Scriblerian publication, with all the elements of multiple authorship (real or rumoured) which this implies. The editors discuss this skilfully, and ascribe the authorship of the 1712 texts firmly to Arbuthnot; while not ruling out the possibility of some collaboration by other members of the Tory circle. Their text is based on the first editions, but the 1727 material is fully recorded.

To both the introduction and the notes, the editors are highly informative and helpful. There are a few minor slips or omissions. "Publisher" does *not* mean publisher (p lxxviii). The words "nominal" and "real" (pp 28, 159n) probably carry an allusion to Swift's *Argument Against Abolishing Christianity*, published the previous year, and there are some misprints. But these are small things.

C. J. Rawson

Handbook

A Librarian's Handbook, compiled by J. D. Taylor, contains as far as possible, complete texts of those documents that are difficult of access and which might be required without notice by librarians in their day-to-day work of administration. It is available from the Publications Department, The Library Association, 7 Ridgmount Street, London WC1E 7AE at £15, and £12 to members of the LA.

Tradition

Morrice Dancers at Revesby, reproduced from a manuscript of 1779, in the British Library is the first publication in a series from the Centre for English Cultural Tradition and Language (CECTAL) at the University of Sheffield and is available from the Centre at 75 Gell Street, Sheffield S3 7QW at £1.75.

Yorkshire

Essays in the Economic and Social History of South Yorkshire, edited by Sidney Pollard and Colin Holmes, contains 17 essays which aim to provide an up-to-date reference work on this new Metropolitan county. It is available from County Council Offices, John Vernon House, 20 Vernon Road, Worsbrough Bridge, Barnsley, South Yorkshire, at £2.50.

Jossey-Bass Publishers
44 Hatton Garden London EC1N 8ER

Sociological Methodology 1977
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LETTERS TO THE EDITOR

Equipment trends

Sir,—Roy McAleese quotes (*THES*, February 18) the example of closed circuit television investment in the early 1970s (surely the 1960s as well?) to chide me for wanting educational equipment to lead rather than follow developments in other fields. In actual fact he has cited the prime example in support of my argument.

A rapid and expensive phase of CCTV installation followed various DES reports and recommendations during 1965-66 and—in the case of universities—the publication of the Brynmor Jones report in 1965. In the great majority of institutions these installations were designed to be facsimiles (as closely parallel as the quite generous funds permitted) of broadcast television studios and related facilities. Not surprisingly, producers and engineers were wooed away from the BBC and ITV to use and care for this equipment, and they in turn reinforced the concept of CCTV "Studio Service".

Now it cannot be denied that in the long term higher education has been enriched by this infusion of professional broadcasters and media men. The cost however of wasted and unneeded facilities has been great. This would not have occurred had there been more attention paid to the teaching and learning requirements of the situation. If the educational use of technology had been subject to the same sort of discipline that is customarily applied to, say, investment in new industrial plant.

Unfortunately, there is evidence that a similar pattern of events may be recurring, and equipment and resources in other fields (computers? telecommunications? data storage and retrieval?), may once again exert a degree of influence on educational practice and investment unwarranted by any systematic analysis of actual pedagogic requirements. It is now 16 years since the appointment of the Hale committee and 14 since that of the Brynmor Jones committee; experiences of recent years in higher and further education suggest very strongly that the time is ripe for a new high-level inquiry into the organization and methods of teaching and learning in the post-secondary sector.

Yours faithfully,
DERICK UNWIN,
Educational Research and Development unit,
Queensland Institute of Technology,
Brisbane,
Australia.

Film costs

Sir,—I am not sure on what basis the figures which suggest that the postgraduate diploma in film studies at the Slade School of Fine Art covers 75 per cent of the cash for the benefit of only 7 per cent of the students were originally calculated, but I do know that, at a staff meeting last week, Professor Gowing withdrew these figures.

Taking into account the fact that MPhil and PhD students (who have only started to be admitted this decade, and not from the beginning of film studies at the Slade) profit from the diploma course screenings, and that expenditures on film studies are not limited to expenditures on the diploma course, I would have estimated that 12½ per cent of Slade students consume approximately 11 per cent of the annual grant. Moreover, when less than 12 months ago I discussed possible economies on the course with Professor Gowing, I was encouraged to go ahead to run the *best possible* course.

Yours sincerely,
JAMES LEAHY,
Director of film studies,
Slade School of Fine Art.

Pope's hypocrisy

Sir,—Douglas Brooks-Davies hails James Reeves's discovery of "Pope's hypocrisy" (*THES*, March 4). Might one not—after a glance at Aristotle—see as much value in that tendency as in those towards genocide, forgery, or maltreatment of wives, on each of which the Hellenmann Educational series perhaps has volumes yet to be released—with some reference to the verse of Sponser, Milton and Shelley?

Yours faithfully,
M. HARDMAN,
Department of English,
Warwick University.

Frazer and his influences

Sir,—As one currently engaged in writing a biography and editing the letters of Sir J. G. Frazer, I should like to comment on Provost Leach's remarks on the newly reprinted *Golden Bough* and its author (*THES*, February 25). By now, all who are interested know that he has availed no opportunity to disparage Frazer, and one sees that it is still the case that nothing Frazerian pleases him.

His procedure is to make Frazer out to be a total waste of time and then to profess mystified amazement that anyone can ever have found him, or even worse finds him, of interest now.

I should like to suggest that there is more to Frazer than Leach has led the reader to believe. Thus, one of his main points is that Frazer's only intellectual begetter was William Robertson Smith, and that Frazer's few, endlessly reiterated ideas were tired Smithian hand-me-downs, and misunderstood ones at that.

But the letters and diaries show clearly that

- Smith was by no means the only important early intellectual influence on Frazer—Henry Jackson and James Ward must be counted as formative in the early years at Trinity (and the Scottish Enlightenment as expounded by his Glasgow professor John Veitch stands behind them);
- the characteristic psychologism—his interest in mental states rather than more overt behaviour—was early in place, for it is evident in his very first classical and philosophical efforts, which means that no great alteration in general orientation was required of Frazer when he started doing anthropology under Smith's direction;
- the comparative method, of which Frazer was at least the most indefatigable practitioner in anthropology in modern times, came from his philological training and not from Smith;
- although it is fair to describe Frazer as Smith's disciple in the early years (1884-87), their emotional and intellectual relationship was much more complex and ambivalent than "discipleship" might suggest. Thus, in an exchange with his younger colleague R. R. Marett in 1911 (the year the 13-volume *Golden Bough* began to appear), Frazer strikingly and completely misrepresented Smith's well-known "ritualist" position on the vexed question of the relation between myth and ritual in primitive religion; namely, that ritual was primary, with myth a secondary growth or accretion.

Frazer denied that this was Smith's position and went out of his way to disavow ritualism for himself as well (he had, and has been, associated with it by many scholars). Marett, surprised, directed him to the relevant passages in *The Religion of the Semites*, and Frazer could only withdraw. (I give the Frazer-Marett letters in my "Frazer on Myth and Ritual", *J. History of Ideas*, January 1975.)

But this sort of selective amnesia is quite typical of the Frazer-Smith connexion; the relation was much more involved and much less unidirectional than connoted by the simple "dependence" that Leach describes. Leach would have been more accurate to say that what Smith did was to turn the erudite young classicist with already-existing folkloristic interests into an anthropologist proper.

After all, Frazer had read *Primitive Culture* several years before he met Smith, until when the project uppermost in his mind was a translation of and commentary upon Pausanius. It was Smith's personal magnetism and, at least as important, the fact that he could give Frazer something to do (in first articles, which climaxed in those fateful ones on Taboo and Totemism, for the *Encyclopaedia Britannica*) that determined Frazer's direction.

If I have made a *prima facie* case that Frazer was not merely an imitator of Smith (and a poor one at that), perhaps I might also indicate what there might be in the wall of Frazer's green volumes that might interest a reader, then and now. I hope it is clear that I am not arguing that Frazer was "right" and that 60 years of anthropologists have been "wrong."

Some people, myself included, actually *like* Frazer's occasionally gorgeous prose (I say "occasionally" because the vast majority of Frazer's pages are composed in a prose that does not seek to call attention to itself). There are broccudol passages, to be sure, which Leach finds "nauseating" and chooses to call "fake Gibbonian"; on the other hand, Herbert Read in *English Prose Style* offers Frazer as a continuator in the twentieth century of the mainstream of formal prose writing. Take your pick.

Frazer may profitably be seen as an example of a certain kind of scholarly mind that gathers and organizes a vast amount of material around a very few simple ideas: the names of Tylor, Mannhardt, Robertson Smith, Durkheim and Eliade suggest that this tendency has not gone unrepresented since Frazer. Laymen always like such writers because their work makes imaginatively comprehensible a whole new mental landscape, whereas specialists tend to dismiss such polymaths for their inevitable simplifications.

In the case of anthropology such a reaction has been especially severe, with a total turning away from the kind of hellenistic comparative evolutionism of someone like Frazer, who for long has been regarded as the epitome of how not to do anthropology.

But Frazer as a modern myth-maker—one whose work has created important images and metaphors that have resonated in the consciousness of our century—will continue to retain a certain importance for the general culture, no matter how unreliable he is on matters of fact (and it is true that he is sometimes unreliable, naive, ethnocentric, and condescending) and no matter how thoroughly he has been disavowed by one group of his professional descendants, the anthropologists (although not by the historians of religion, the classicists, and the literary critics).

I can understand why, from the point of view of the evolution of anthropology, Provost Leach should think Frazer a regrettable distraction. But perhaps he is also willing to allow that Frazer's importance for the larger (and especially the literary) culture in the first quarter or third of this century was neither baseless nor mysterious, and perhaps he is also willing, in the light of what I have presented above (and much of it is based on unpublished material), to suspend his judgment of Frazer as wholly a figment of Smith's creation.

Yours sincerely,
ROBERT ACKERMAN,
311 West 24 Street,
New York, NY 10011.

Spatial reasoning

Sir,—In view of Mr Bermingham's recent correspondence (9 February 11) regarding his research into spatial reasoning and the correspondence on this subject which reference was made to his own studies into the problems encountered by many engineering students with the spatial perception of engineering drawings, may I be permitted to make several observations.

Mr Bermingham's patient research only serves to confirm a fact that many educationists, experienced in the teaching of engineering drawing and design to engineering students, have been aware of for some time. Today as our colleges and universities enrol more and more overseas students on to their conventional engineering design courses many more lecturers are being confronted with problems in the classroom/drawing office practice for which they have neither been prepared nor equipped to deal.

In 1971 the United Kingdom overseas student population on engineering courses was 8,000; in 1975 it had fallen to 3,500. Hopefully we need go no further than our own secondary comprehensive schools to find similar problems with regard to spatial perception of our pupils, if not peculiar, engineering drawing conventions.

Hopefully the problem is highlighted by the overseas student population will generate sufficient needed research into this important area of engineering and methods to improve the spatial perception of two-dimensional line drawings for all students.

It has been said that finding the appropriate range of a pencil is almost tantamount to finding a solution and I now believe that teaching techniques can be developed to link cultural patterns of visual communication with those of our engineering traditions. The critical factor, with regard to overseas students undertaking engineering degree courses in the United Kingdom, is time.

Generally their entrance qualifications are lower than those of their British counterparts but deficiencies in engineering background cannot be made up overnight. It is sad for these students that so many courses in engineering design and communication are undertaken purely to any degree studies.

In view of the relatively high mathematical standard of many students from the Third World I predict that the second phase of Mr Bermingham's study will reveal that these students also have a very satisfactory final examination standard since the majority of engineering degree courses have long since lost any reference to the basic principles of engineering production which this country desperately needs now.

Yours faithfully,
NEIL DAVIES,
Industrial research associate,
Department of applied sociology,
Uwist,
Cardiff.

Melbourne watchdog

Sir,—You say that Australia's fifth University is "in the first instance to build in a sort of collective conscience or watchdog for the advancement of research and learning" (*THES*, February 11). Without wishing to spark off a bout of one-up-person-ship and claim that honour for the University of Melbourne?

Our real conscience and watchdog is the university senate, created in 1973. This is not part of the governmental hierarchy of the university, and has no executive powers. Its boards but does have the right to obtain information and to make suggestions and recommendations. It is entirely elected by staff (academic and other) and students, despite this electorate has the majority of staff.

The members are largely people outside the existing power structures, and their use of senate powers is leading to a thorough examination of many issues that would otherwise have remained untouched. A catalogue of our failures would not fit here, so I will only say they are of the kind you would expect from a body that has across between a loyal opposition and a roaving royal commission.

Yours sincerely,
C. JAS. MITCHELL,
Secretary,
University Assembly,
Melbourne University.

BEd constraints

Sir,—Mr Nokes' clarification (*THES*, March 4) of Stephen Cohen's rather disturbing report on current BEd degrees (*THES*, February 25) was most welcome, but he should recognize also that some of the constraints imposed by The Council for National Academic Awards policy are contributing in no small way to the very problems he is discussing.

It is fair to say that the CNAA does not prescribe general patterns for courses, but it does promote inflexible course structures by, for example, discouraging joint teaching of certificate and degree students and common teaching across two years of a course. There is much to be said for both these practices and no evidence against them.

It is just such constraints that limit the types of courses that can be mounted and make it more difficult for polytechnics to provide both for three-year BEd and four year honours BEd programmes. At the North Riding College of Education, validation by an enlightened university enables us to mount certificate in education, DipHE, BEd, and BEd (hons) programmes with no difficulty at all, and to offer a variety of options unrivalled, to the best of our knowledge, by any institution twice our size.

The logistical problems to which Mr Nokes refers arise directly from the kind of constraints imposed by his council, and the inevitable search that then follows for yet more interlocking programmes is certain to curtail the professional quality of teacher education.

The Secretary of State herself has rightly expressed concern at the alarming slide away from professional courses, but the root causes of this malaise have not been widely recognized.

The "sluggish progress" made by some of the courses under consideration by the CNAA could well be a measure of the council's own failure to advise its clients of alternative approaches to the numbers game rather than of "difficulties staff are facing ... over reduced intakes".

Mr Nokes' research team could save themselves a lot of time if they caught the train from King's Cross as soon as they are appointed. The weather here is marvellous at the moment.

Yours sincerely,
K. E. ROBINSON,
Deputy principal,
North Riding College of Education,
Scarborough.

Handicapped students

Sir,—Attention has been focussed on costs per student in further education, and will no doubt be addressed to the conclusions of the Warnock Committee inquiry into special education.

One area of human pain and disappointment, and of unnecessary costs in time and money can be known to local vocational exports. It is that deriving from the increasing and welcome applications for entry into vocational courses of all sorts by high ability candidates with non-traumatic handicap.

Course qualifications are a minefield, and no doubt liberal decisions are taken by many admissions officers. But nothing can easily compensate candidates, having experienced undoubted benefits from time in integrated education, when they discover that subjects which qualify them for grants do not qualify them for consideration for professional courses.

I have had applications from people with very varying disabilities who have had the same frustrating experience whether seeking entry to business, environmental or engineering faculties.

Liberal decisions cannot always compensate for the lack of O-level mathematics, or for "non-academic" A levels that have been misguidedly chosen. The cause of integrated education may be damaged by ignoring this, or, more likely, not even knowing that it happens.

Yours faithfully,
G. A. BISHTON,
Coordinator for handicapped students,
North East London Polytechnic.

S.S. Great Britain

Sir, I would like to draw attention to a heartening exhibition at the Science Museum. It consists of large scale illustrations of Brunel's famous ship, the ss Great Britain, drawn by students of the school of technical illustration at Bournemouth and Poole College of Art, and is quite remarkable work of enthusiasm and dedication by a group of young people.

These expansive illustrations of the old ship, now being restored at Bristol, have been designed expressly to help visitors understand the construction of the vessel. As well as conveying clearly the internal and external features in great detail, the drawings portray brilliantly the style and atmosphere of mid-nineteenth century sea travel.

The Great Britain was scuttled at the Falkland Islands in 1937. Years later it was found that she had not broken up and in a letter to *The Times* Dr Ewan Corlett, the eminent naval architect, suggested that as one of the world's historic ships, she should, if possible, be preserved. Thus the ss Great Britain Project was formed. In a rescue operation that was itself something of an epic, the old ship was raised and brought back to the Great Western Dock in Bristol, exactly where the Prince Consort launched her 127 years ago.

Pictorial explanatory information of this quality is rare and there is need for more of this work to be done—perhaps of other forms of transport, historic houses and industrial archeology.

Those professionally interested and those who might be curious to see quite exceptional work by enthusiastic young students will, I am sure, find a visit to the Science Museum well worth while.

Yours faithfully,
S. M. PAINE,
Lecturer in charge of technical illustration,
Bournemouth and Poole College of Art.

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Applications are invited for the following posts, for which applications close on the dates shown. SALARIES (unless otherwise stated) are as follows: Senior Lecturer, $A17,795 to $A22,010; Lecturer $A13,850 to $A16,389. Further details, conditions of appointment for each post, method of application and application form, where applicable, may be obtained from the Association of Commonwealth Universities (Appointments), 36 Gordon Square, London WC1H 0PF.

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LECTURER IN BEHAVIOURAL SCIENCES IN MEDICINE

Applications are invited from candidates with postgraduate training in one or more of the behavioural sciences (especially psychology, anthropology or social psychology) and with some training and/or experience in application of their discipline in teaching and further development of courses in behavioural sciences for medical undergraduates begun in 1974.
This position is permanent but may be filled for three years in the first instance with possibility of permanency during that time, or in certain cases return for a second term.
April 29, 1977.

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Applications are invited for the post of Professor and Head of the Department of Architecture.

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Trinity College

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Persons interested should write for further particulars to:

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These are the first posts to be established in this new institution. Teaching will begin in September 1977. Appointment will be made at an appropriate level within the grades of Professor, Reader, Senior Lecturer or Lecturer. Preference will be given to candidates suitably qualified for the more senior appointments.

Applicants should have good degrees(s) in public administration, working experience in central or local government in a developing country and special interests in organisation and the development and application of management techniques in the public sector would be desirable additional qualifications and experience. The British Government is unlikely to supplement salaries. Short-term contracts for two, four or six years to expatriates; permanent and pensionable terms for local candidates after successful completion of two years on probation.

If appointment is for limited period a 20% Gratuity is paid in lieu of superannuation for the first two years of service; 27.5% for the second two years. A 15% inducement Allowance is payable to expatriates not qualifying for superannuation from other sources. Housing Allowance 5% of basic salary. Education Allowance for expatriates, free ordinary medical attention, accommodation at reasonable rental, travelling expenses for appointee, wife and dependent children on appointment and normal termination. Biennial leave. Detailed applications (3 copies) including a curriculum vitae and naming 3 referees (with addresses) should be forwarded not later than Wednesday, 20 April, 1977 to the Registrar, University College of Swaziland, Private Bag, Kwaluseni, Swaziland. Applicants resident in UK should also send 1 copy to Inter-University Council, 90/91 Tottenham Court Road, London W1P 0DT. Further particulars may be obtained from other address.

UNIVERSITY OF BOTSWANA AND SWAZILAND
(University College of Swaziland)

Applications are invited for the post of

LECTURER IN THE DEPARTMENT OF CHEMISTRY

Candidates should hold a Ph.D. and specialize in Physical Chemistry, Inorganic or Organic Chemistry qualifications will also be considered. The appointee will teach the first two years of the Chemistry course and possibly the third and fourth years from 1980 onwards. There will be opportunity for research. Basic Salary Scale: (Salary scales and Conditions of Service are currently under review). Lecturer: £3,924-£5,376 (£1 sterling = £1.481. Salary Scale and entry point according to qualifications and experience. The British Government is unlikely to supplement salaries. Short-term contracts for two, four or six years to expatriates; permanent and pensionable terms for local candidates after successful completion of two years on probation. If appointment is for limited period a 20% Gratuity is paid in lieu of superannuation for the first two years of service; 27.5% for the second two years. A 15% inducement Allowance is payable to expatriates not qualifying for superannuation from other sources. Housing Allowance 5% of basic salary. Education Allowance for expatriates, free ordinary medical attention, accommodation at reasonable rental, travelling expenses for appointee, wife and dependent children on appointment and normal termination. Biennial leave. Detailed applications (3 copies) including a curriculum vitae and naming 3 referees (with addresses) should be forwarded not later than Wednesday, 20 April, 1977 to the Registrar, University College of Swaziland, Private Bag, Kwaluseni, Swaziland. Applicants resident in UK should also send 1 copy to Inter-University Council, 90/91 Tottenham Court Road, London W1P 0DT. Further particulars may be obtained from other address.

BAYERO UNIVERSITY COLLEGE—NIGERIA

Applications are invited in the

DEPARTMENT OF EDUCATION RESEARCH AND COMMUNITY SERVICES

for the posts of

LECTURERS/TUTORS

in (i) Mathematics Education. (ii) Language Arts (Arabic, English, French); (iii) Hausa and Hausa Methods. (iv) Islamic and Islamic History. (v) Islamic Theology; (vi) Social Studies. (vii) Science Education (Mathematics, Physics or Chemistry). (viii) Geography and Geography Method. Candidates should hold an Honour degree.

Salary: Nis.400-16,824 p.a. (£4,666-£5,970 p.a. sterling) £1 sterling equals N1.171). Family passages; various allowances; superannuation scheme; biennial leaves.

Detailed applications (2 copies), including a curriculum vitae and naming 3 referees, should be forwarded by airmail, not later than 15 April, 1977, to the Registrar, Bayero University College, Kano, Nigeria. Applicants resident in UK should also send 1 copy to Inter-University Council, 90/91 Tottenham Court Road, London, W1P 0DT. Further particulars may be obtained from either address.

UNIVERSITY OF WESTERN AUSTRALIA
Perth

FRENCH STUDIES

Applications are invited for appointment as

LECTURER

in the Department of French Studies. This will be a temporary appointment for a period of two years (initially as from August, 1977 or as soon as possible thereafter. Candidates should hold a doctorate or have equivalent qualifications and expertise. The appointee will be expected to teach French to the usual limits of French language and literature from 1000, but preference may be given to a specialist in nineteenth century French literature. The possibility also exists for an appointment on secondment or as a visiting Lecturer on negotiable terms.

The current salary range for a Lecturer is $A13,850-$A16,389 p.a. An appointee appointed for two years would be entitled to fares for self and fully dependent family and removal allowance, and for similar transportation benefits on completion of two years' service.

Applications in duplicate stating full personal particulars, qualifications and experience, should reach the Staffing Officer, University of Western Australia, Nedlands, Western Australia, 6009, by 25 April, 1977. Candidates should request three referees to write immediately to the Staffing Officer.

MASSEY UNIVERSITY
Palmerston North, New Zealand

Department of Marketing

SENIOR LECTURER/ LECTURER in MARKETING

Applications are invited for the above-mentioned Lectureship in the Department of Marketing. Applicants should have a University degree and have substantial experience in teaching and/or practising Marketing Management. The appointee will join a staff of six in the Department and will be closely associated with the Market Research Centre, which has a staff of seven.

The appointee will be encouraged to take responsibility for developing and teaching courses in Marketing Management and in more specialized advanced fields. Expertise in the field of consumer behaviour would be an advantage but is not essential. The successful applicant will be expected to develop a programme of research and will be encouraged to participate in Massey Research Centre projects. In suitable circumstances, appropriate research could assist the appointee in qualification for a higher degree.

Salary ranges:
Lecturer NZ$9,385-NZ$11,685
Senior Lecturer NZ$11,685-NZ$13,615.

Further details of the position and of the University together with conditions of appointment and information to be supplied by applicants, may be obtained from the Association of Commonwealth Universities (Appointments), 36 Gordon Square, London WC1H 0PF, or from the Registrar of Massey University, Palmerston North, New Zealand.

Applications close on 27 May, 1977.

BATH
THE UNIVERSITY
UNIVERSITY LIBRARY
PROGRAMME OF CATALOGUE RESEARCH

Applications are invited for the posts of RESEARCH FELLOW (£3,924-£5,376) and RESEARCH ASSISTANT (£2,466-£3,480) on the following projects sponsored by the British Library:—

(i) A study into the content and sources of catalogue data for local use.

(ii) An investigation of the structure of subject index to library catalogues through keyword analysis.

The appointments are for two years and are supported posts. Salaries will be on the University scales and will be dependent upon qualifications and experience. The successful candidate will be associated with the Market Research Centre, which has a staff of seven.

The appointee will be encouraged to take responsibility for developing and teaching courses in Marketing Management and in more specialized advanced fields. Expertise in the field of consumer behaviour would be an advantage but is not essential. The successful applicant will be expected to develop a programme of research and will be encouraged to participate in Massey Research Centre projects. In suitable circumstances, appropriate research could assist the appointee in qualification for a higher degree.

Salary ranges:
Lecturer NZ$9,385-NZ$11,685
Senior Lecturer NZ$11,685-NZ$13,615.

Further details of the position and of the University together with conditions of appointment and information to be supplied by applicants, may be obtained from the Association of Commonwealth Universities (Appointments), 36 Gordon Square, London WC1H 0PF, or from the Registrar of Massey University, Palmerston North, New Zealand.

Applications close on 27 May, 1977.

BATH
THE UNIVERSITY
UNIVERSITY LIBRARY
RESEARCH OFFICER

A STATISTICAL COMPUTATION Officer is invited to this post, which is intended to provide statistical support for the development projects in the library. The duties will include the analysis of questionnaire data, the development of statistical models, and the application of statistical techniques to the solution of problems in the library. The appointee will be responsible for the day-to-day running of the Statistical Computation Unit, and for the supervision of the work of a Statistical Assistant.

Applicants should have a good honours degree in mathematics or statistics and preferably some experience of computer programming and statistical analysis. Experience in industry, commerce or government would be desirable.

Salary within scale: £3,335 to £4,356 per annum, superannuable.

Further particulars and application forms (to be returned not later than 25th April) from the Secretary, The University, Bath BA2 7AY. Please quote reference number 77/77.

BRADFORD
THE UNIVERSITY
MANAGEMENT CENTRE
ASSISTANT DIRECTOR OF MANAGEMENT DEVELOPMENT PROGRAMMES

Applications are invited for the appointment of two posts to work with the Director in developing and administering a wide range of management development programmes. The Centre's programmes include a substantial number of tailor-made courses for individual companies in industry, commerce and the public sector.

Applicants should have good academic qualifications and experience in teaching and research in management and behavioural sciences. Experience in industry, commerce or government and a knowledge of management and its techniques would be an advantage.

Salary within scale: £3,335 to £4,356 per annum, superannuable.

Further particulars and application forms (to be returned not later than 25th April) from the Secretary, The University, Bradford BD7 1DP.

BIRMINGHAM
THE UNIVERSITY
DEPARTMENT OF FRENCH

Applications are invited for a Lectureship in French, tenable from 1 October 1977 or as soon thereafter as may be convenient. The successful candidate will be expected to teach French language and literature from 1000 to 1830. Salary on scale £3,333 to £6,156, with appropriate allowances.

Further particulars from the Secretary, The University, Birmingham B15 2TT, to whom applications (two copies) should be lodged by 15th April, 1977.

ABERDEEN
THE UNIVERSITY

TEMPORARY LECTURESHIP IN HISTORY

Applications are invited for a Temporary Lectureship in History, tenable for one year from 1977-78. The successful candidate will be expected to teach British Economic History from 1700 to 1850.

Salary on scale £3,333 to £6,156, with appropriate allowances.

Further particulars from the Secretary, The University, Aberdeen, to whom applications (two copies) should be lodged by 15th April, 1977.

BATH
THE UNIVERSITY
SCHOOL OF HUMAN COMMUNICATION

LECTURER IN SOCIOLOGY

Applications are invited for Duties: Responsibility for the sociological aspects of work in the multidisciplinary School of Human Communication. Qualifications: Good honours degree in sociology and preferably a higher degree or professional qualification and experience in industry, commerce or government. Some academic qualifications and experience in teaching and research in management and/or marketing fields are required. Ability to work in a multidisciplinary context and to contribute to courses in management and communication.

Salary within scale: £3,335 to £4,356 per annum, superannuable.

Further particulars and application forms (to be returned not later than 25th April) from the Secretary, The University, Bath BA2 7AY. Please quote reference number 77/78.

Further details/application forms obtainable from the Registrar, University of Bradford, Yorkshire BD7 1DP.

Universities continued

Murdoch University

Perth, Western Australia

Murdoch University, Western Australia's second university, admitted its first students in February, 1975. The University is committed to taking a fresh approach to higher education, with the goal of responding directly to the conditions and needs of the late twentieth century. This is reflected in admission policies, organisation structures, programmes of study, philosophies of teaching and recruitment of staff. The University is organised on a system of schools of study, with the Dean of each school having both academic and administrative responsibility.

Applications are invited from suitably qualified persons for the following positions which are to be taken up in January, 1978, or as soon thereafter as possible :—

SCHOOL OF EDUCATION

(Dean, Professor B. V. Hill)

LECTURER/SENIOR LECTURER in EDUCATION (Educational Psychology)

(Ref. EN 0227)

Applicants should be qualified in both psychology and education. Experience and research in the general areas of either educational psychology or special education, with special emphasis on learning and human development, including exceptional development, would be desirable. Duties will include teaching psychology to undergraduate and postgraduate students in education, and supervision of postgraduate research students.

LECTURER in EDUCATION (Curriculum)

(Ref. EN 0444)

Preference will be given to applicants with a strong background in curriculum theory and development and teaching experience in a major area such as mathematics or English language and literature. Duties will include undergraduate and postgraduate teaching, and co-supervision of postgraduate research students.

Salary ranges : Lecturer $A13,850 to $A18,389 ; Senior Lecturer $A18,795 to $A22,010.

Conditions of appointment include superannuation, similar to F.S.S.U., long service leave, assisted study leave, payment of fares to Perth for appointee and dependent family, removal and settling-in allowances and house purchase scheme.

Procedure for Applications :

There is no prescribed application form, but TWO COMPLETE SETS of detailed applications, quoting the appropriate reference number, including full personal particulars, details of tertiary qualifications, career history with description of posts held, area of special competence and interest, research completed or currently being undertaken, personal views on teaching, membership of professional institutions or societies and positions of responsibility in these ; list of relevant material published by the applicant, when available to take up appointment if offered and the names and addresses of three professional referees should reach the Personnel Officer, Murdoch University, Murdoch, Western Australia, 6153, by April 22, 1977.

Applicants should request the three professional referees to write immediately, quoting the appropriate reference number to the Personnel Officer, Murdoch University.

Applicants resident in the United Kingdom, Europe or Africa at the time of application should also forward ONE further copy to the Association of Commonwealth Universities (Appts.), 36 Gordon Square, LONDON, WC1H 0PF, from whom conditions of appointment may be obtained.

University of Wales

UWIST

BUSINESS ADMINISTRATION AND ACCOUNTANCY

LECTURER ACCOUNTANCY

Salary : £3,333 to £6,665

Requests (quoting Ref. THES) for details and application form to Personnel Section (Academic) UWIST, Cardiff CF1 3NU

Closing date : 15th April 1977

BAYERO UNIVERSITY COLLEGE—NIGERIA

Applications are invited in the DEPARTMENT OF ECONOMICS for the following posts :

(a) PROFESSOR. Candidates should hold a Ph.D., have several years' teaching experience and the ability to initiate and develop research projects.

(b) SENIOR LECTURER. Candidates must hold a Master's degree, have at least five years' teaching experience and the ability to initiate and develop research projects.

(c) LECTURER. Candidates should have a higher degree and at least three years' teaching experience.

Salary scales (a) N11,268-N12,420 p.a. (£9,630-£10,615 p.a. sterling). (b) N7,764-N8,730 p.a. (£6,636-£7,461 p.a. sterling). (c) N6,460-N6,984 p.a. (£4,686-£5,970 p.a. sterling). (£1 sterling equals N1.17.) There may be supplementation of salaries for married appointees to posts (a) and (b) in range £2,160-£2,892 p.a. (sterling) or for single appointee to post (b) only of £728 p.a. (sterling) (normally free of all tax and usually reviewed annually) and provision of children's education allowances and holiday visit passages. This supplementation will not apply to single appointees to Professorial level or to any appointees to Lecturer level. Family passages; various allowances, superannuation scheme, biennial overseas leave.

Detailed applications (2 copies), including a curriculum vitae and naming 3 referees, should be forwarded by airmail, not later than 16 April, 1977, to the Registrar, Bayero University College, Kano, Nigeria. Applicants resident in UK should also send 1 copy to Inter-University Council, 90/91 Tottenham Court Road, London, W1P 0DT. Further particulars may be obtained from either address.

BAYERO UNIVERSITY COLLEGE—NIGERIA

Applications are invited in the

FACULTY OF TECHNOLOGY for the post of PROFESSOR AND DEAN OF THE FACULTY

Candidates should hold a Ph.D. (preferably in Civil Engineering), experience in teaching, research and curriculum development, experience in planning a new faculty of Engineering, staff development and recruitment. Familiarity with the problems of technical education in a third world country is essential. The Dean will be responsible for developing a training programme for engineers. He should have a broad educational background and considerable knowledge of many branches of engineering. Industrial experience would be an advantage. Salary : N11,268-N12,420 p.a. (£9,630-£10,615 p.a. sterling) (£1 sterling = N1.17). There may be supplementation of salary by £2,160 p.a. (sterling) for married appointee. (Single Professor will not be eligible for supplement). (usually free of tax and reviewed annually) and provision for children's education allowances and holiday visit passages. Family passages: various allowances, superannuation scheme; biennial overseas leave. Detailed applications (2 copies), including a curriculum vitae and naming 3 referees, should be forwarded by airmail, not later than 16 April, 1977 to the Registrar, Bayero University College, Kano, Nigeria.

Applicants resident in UK should also send 1 copy to Inter-University Council, 90/91 Tottenham Court Road, London W1P 0DT. Further particulars may be obtained from either address.

BRADFORD

THE UNIVERSITY

MANAGEMENT CENTRE

LECTURESHIP IN PRODUCTION MANAGEMENT

Candidates should hold good honours degree in science or technology and ideally a postgraduate management qualification. Experience in production engineering essential. Teaching will be undertaken at all levels, including undergraduate, post-experience and the MBA programme. Research encouraged: teams already active in production management and related fields, including systems design.

Salary within scale: £3,333 to £6,665 per annum. Superannuable.

Further particulars and application forms (to be returned as soon as possible) obtainable from the Registrar, Post Ref. MA/L/PO/TH, University of Bradford, West Yorkshire BD7 1DP. Informal inquiries to Professor K. G. Lockyer.

BUCKINGHAM

UNIVERSITY COLLEGE

TWO LECTURESHIPS IN LAW

On (from July, 1977) to specialize in Tax Law. Other from July or October. Public International Law an advantage. Salary not less than in comparable U.G.C.-financed posts U.S.S.

Particulars from Registrar, UCB, MK18 1EG.

CAMBRIDGE

UNIVERSITY OF CAMBRIDGE UNIVERSITY ASSISTANT LECTURESHIP IN THE DEPARTMENT OF HISTORY OF ART

The Appointments Committee of the Faculty of Architecture and History of Art hope soon to be in a position to appoint a University Assistant Lecturer in the Department of the History of Art to take up appointment in October, 1977. Preference may be given to candidates specialising on some aspect of European art in the fifteenth, sixteenth, or seventeenth centuries.

The appointment will be for three years, with the possibility of reappointment for two years. The pensionable scale of stipends for a University Assistant Lecturer, not ordinarily resident in College, is £3,547 a year, rising by four annual increments to £4,405.

Further information and application forms may be obtained from the Secretary to the Appointments Committee for the Faculty of Architecture and History of Art, 1 Scroope Terrace, Cambridge CB2 1PX. Applications, together with curriculum vitae and the names of two referees should be submitted to him not later than April 26, 1977.

CAPE TOWN

THE UNIVERSITY

LECTURESHIP IN ENGLISH

Applications are invited for the above post, vacant as from January 1, 1978. Appointment, according to qualifications and experience, will be made on the salary scale R6,300 by R360 to R9,180 per annum, plus a pensionable allowance of 10 per cent of basic salary.

There are opportunities in the department to teach the usual topics in language and literature. Candidates should state their special interests, but preference will be given to persons with a critical interest able to apply themselves to a wide field.

Applicants should submit a curriculum vitae, stating present salary, research interests and publications, when available if appointed and the names and addresses of three referees.

Memoranda concerning the position and general conditions of service should be obtained from the Registrar, Room 1, University of Cape Town, Private Bag AA, Rondebosch, 7700, by whom applications must be received not later than May 30, 1977.

DURHAM

THE UNIVERSITY

ADMINISTRATIVE ASSISTANT ST. AIDAN'S COLLEGE

Applications are invited from GRADUATES/STUDENTS expecting to graduate in June, 1977, for the above post, to start on June 1, 1977, or earliest date thereafter. Salary on the scale £2,904 to £4,811 per annum.

Further particulars from the Principal, St. Aidan's College, Durham DH1 3LJ, to whom applications (three copies), with the names of two referees, should be sent by April 9, 1977.

EDINBURGH

THE UNIVERSITY

CHAIR OF SCOTS LAW

The above Chair is vacant, and the Faculty of Advocates is required by statute to nominate two persons qualified to occupy the Chair.

The Professor is responsible for teaching, research, and administration in the Department of Scots Law. The appointment is full-time. Salary not less than £8,106 per annum.

Further particulars from: The Clerk of Faculty, Advocates' Library, Edinburgh EH1 1RF, with whom applications must be lodged by 18th April, 1977. Please quote Reference 3/77.

HULL

THE UNIVERSITY

DEPARTMENT OF ENGLISH

Applications are invited for the post of LECTURER in ENGLISH LITERATURE. The person appointed will be required to teach in a period (or periods) of English Literature from 1500 to the present day. Some preference may be given to candidates with research interests in the Renaissance and at least one other period.

Salary scale: £3,333 to £6,665 per annum plus FSSU/USS benefits.

Applications (six copies) giving details of age, qualifications and experience together with the names of three referees, should be sent by 7 April, 1977, to the Registrar, University of Hull, Hull, HU6 7RX, from whom further particulars may be obtained.

LANCASTER

THE UNIVERSITY

LECTURER IN ACCOUNTING AND FINANCE

Applications are invited for this post in the Department of Accounting and Finance. The salary will be fixed at an appropriate point on the Lecturer scale (£3,333 to £6,665). Well-qualified applicants are sought for teaching and research in accounting.

Further particulars may be obtained (quoting reference L/C/...) from the Establishment Officer, University House, Lancaster LA1 4YW, to whom applications (six copies—in the case of overseas applicants one copy by airmail), naming three referees, should be sent not later than 15th April, 1977.

HULL

THE UNIVERSITY

DEPARTMENT OF ADULT EDUCATION

RESEARCH POST IN ADULT EDUCATION

RESEARCH ASSISTANT, to work in the Industrial Studies Unit of the Department. The work will entail research into local industrial relations and trade unionism, and will be particularly related to the developing programme of trade union day release courses provided by the Department in co-operation with local trade unions, employers, and the TUC Education Department. Some administrative duties will be involved, and there will be some opportunity to participate in the teaching work on the day release programme. The appointment will be for one year in the first instance, with possible renewal, commencing in June, 1977. Candidates should have obtained a good honours degree in one of the Social Sciences, and preferably one which includes a study of industrial relations. Experience of research in a relevant field is desirable.

Salary scale £2,904 to £4,180 (Grade IB for Research and Analogous Staff).

Applications (four copies) giving details of age, qualifications and experience, together with the names of three referees, should be sent by 12 April, 1977, to the Registrar, The University of Hull, Hull, HU6 7RX, from whom further particulars may be obtained.

ITALY

THE UNIVERSITY OF LECCE

LECTOR in ENGLISH required November, 1977. Applicants should have Honours Degree, with Postgraduate qualification or University teaching experience. Monthly salary 450,000 lire.

Curriculum vitae with references should be addressed to: the Director, Instituto di Lingue Straniere, Facoltà di Magistero, Università di Lecce.

KEELE

THE UNIVERSITY

LECTURESHIP IN CRIMINOLOGY

Applications invited for Lectureship in Criminology within Department of Law. Legal qualifications not required. Interest in statistics and/or research methods welcome. Salary on Lecturer Scale £3,333 to £6,665 per annum. Initial placing depending on age and experience.

Application forms and further particulars from the Registrar, The University, Keele, Staffs., ST5 5BG, to whom completed forms should be returned by April 30, 1977.

KENT

THE UNIVERSITY

Canterbury

FACULTY OF SOCIAL SCIENCES

TEMPORARY LECTURESHIP IN INTERDISCIPLINARY STUDIES

Applications are invited for a two-year temporary Lectureship in Interdisciplinary Studies to teach a course, devised by the person appointed, focusing on the theme of risk. Persons with qualifications in any Social Science discipline are invited to apply, but the Board of Interdisciplinary Studies would particularly welcome enquiries from those with qualifications in Psychology.

The appointment will be from 1st October, 1977, or earlier if this is appropriate. Salary will be on the scale £3,333 to £6,665.

Further particulars and application forms may be obtained from Mr. J. E. Reilly, Assistant Registrar, Cornwallis Building, The University, Canterbury, Kent. Completed applications (three copies) should be returned not later than Monday, 4th April, 1977. Please quote reference A 6/77.

LEEDS

THE UNIVERSITY

DEPARTMENT OF PLANT SCIENCES

Applications are invited for the CHAIR of CROP SCIENCE vacant by the resignation of Professor P. D. H. Tinker. Applications will be welcomed from candidates with interests in crop physiology, plant pathology, soil science and plant nutrition, crop protection, agricultural meteorology or in any of the cognate sciences which relate to crop production. The salary will be within the professorial range and the appointment will be from a date to be arranged with the successful candidate. The university reserves the right to consider for appointment persons other than those who submit formal applications.

Applications (two copies) stating age, qualifications and experience, and naming three referees, should reach the Registrar, The University, Leeds LS2 9JT, (from whom further particulars may be obtained), quoting reference number 83/5/DG, not later than May 14, 1977. Applicants from overseas may apply in the first instance by cable, naming three referees, two of whom should, preferably, be in the United Kingdom.

NOTTINGHAM

THE UNIVERSITY

ASSISTANT REGISTRAR

Applications are invited for this appointment which will involve responsibility in the fields of ceremonial, examinations and publications. The appointment will be effective from 1st June, 1977, or as soon as possible thereafter and will be within the Administrative Grade II salary scale £5,403 to £6,666 per annum.

Further details and forms of application, returnable not later than 7th April, 1977, from the Staff Appointments Officer, University of Nottingham, University Park, Nottingham NG7 2RD, Ref. No. 804.

MANCHESTER

THE UNIVERSITY

INSTITUTE OF SCIENCE AND TECHNOLOGY

CORROSION AND PROTECTION CENTRE

POST-DOCTORAL APPOINTMENTS

Applications are invited from scientists or engineers of either sex for two-year appointments, commencing from June 1977, for work in either:—

(a) the study of atmospheric corrosion initiation by particulate pollutants, using electron microscopy and Auger spectroscopy ;

(b) the survey and experimental study of corrosion problems in agriculture.

Previous relevant experience is desirable but other good applicants will be considered. The salary will be on Range 1A £3,333 to £3,627, with starting salary not exceeding £3,761.

Candidates should contact Professor G. C. Wood, Corrosion and Protection Centre, UMIST, P.O. Box 88, Manchester M60 1QD.

NOTTINGHAM

THE UNIVERSITY

MEDICAL SCHOOL

DEPARTMENT OF BIOCHEMISTRY

POST-DOCTORAL RESEARCH FELLOW

Applications are invited for a research fellowship financed by an industrial company for a study of dietary phospholipids and liver lipid metabolism in relation to heart disease. The fellowship is tenable for three years from September 1, 1977, or a date to be agreed. Initial salary £3,333 or £3,647, with membership of U.S.S.

Applications with curriculum vitae and the names of two referees should be sent as soon as possible to Professor J. N. Hawthorne, Department of Biochemistry, University Hospital and Medical School, Nottingham NG7 2UH, from whom further details may be obtained (telephone 0602-700111, ext. 3488).

SOUTHAMPTON

THE UNIVERSITY

INSTITUTE OF SOUND AND VIBRATION RESEARCH

Applications are invited for a three-year appointment of Temporary Lecturer in the Institute of Sound and Vibration Research.

Candidates should have postdoctoral experience and research interests in applied acoustics.

Salary within lower part of scale £3,333 to £6,665 per annum. Initial salary will depend on qualifications and experience. Further particulars may be obtained from D. A. S. Copland, The University, Southampton SO9 5NH, to whom applications (seven copies from United Kingdom applicants) should be sent not later than 1st May, 1977. Please quote reference 238/A/THES.

SALFORD

THE UNIVERSITY

PHYSICAL EDUCATION SECTION

LECTURESHIP

Applications are invited for the post of Lecturer in Physical Education. Candidates should possess relevant qualifications in the Psychological Aspects of Human Movement. A postgraduate degree and relevant teaching experience would prove advantageous. The post would involve teaching and research in the various areas of psychology as they relate to human performance and sport.

Informal enquiries may be made to Mr. D. Masterson, Director of Physical Education (061-736 5843, extension 7226).

Salary within the scale: £3,333 to £6,665 USS/FSSU.

Further particulars and application forms may be obtained from the Registrar, University of Salford, Salford M5 4WT, to whom completed applications should be returned by 15 April, 1977, quoting reference number PE/23/THES.

THAILAND

THE ASIAN INSTITUTE OF TECHNOLOGY

Applications are invited from Australian citizens for the faculty positions in the following fields:

APPLIED MATHEMATICS

ENGINEERING ECONOMICS, CONSTRUCTION ENGINEERING and MANAGEMENT, INDUSTRIAL ENGINEERING and MANAGEMENT, IRRIGATION ENGINEERING, STRUCTURAL ENGINEERING and MATERIALS.

Appointments available at assistant, associate or full professor levels with attractive conditions and negotiable salary. Preference given to candidates with a Ph.D. in the required field. Duties include: teaching postgraduate courses, supervision of master and doctoral degree candidates; research including contract research and assisting in extension programmes. Appointments begin 1 September, 1 January, or 1 May.

The A.I.T., established in 1959, is situated in Thailand on 400 acre campus 42 km north of Bangkok. The Institute is an international, autonomous, postgraduate, engineering institution governed by an International Board of Trustees. Students from 20 Asian countries and an international faculty are involved in advanced education in engineering, science and allied fields. The Institute's plant and laboratories are well equipped. Support for A.I.T. comes from 20 governments throughout the world and numerous international organizations. Two Australians serve on the Institute's Board of Trustees. The Australian Government under an aid grant of $2,000,000 is providing funds for Australian faculty positions.

Applications, quoting Ref. A2/77, and including curriculum vitae and the names and addresses of three referees should be sent to the Vice-President and Provost, A.I.T., P.O. Box 2754, Bangkok, Thailand.

READING

THE UNIVERSITY

TEMPORARY LECTURESHIP IN ENGLISH

Applications are invited for a Temporary Lectureship for two years in English Literature. Candidates should be qualified to teach both Chaucer and the writers of a later period.

The person appointed should take up duties on September 1, 1977.

Further information may be obtained from the Registrar (Room 214, Whiteknights House), The University, Whiteknights, Reading, RG6 2AH, by whom applications should be received not later than April 30, 1977.

Fellowships and Studentships

CAMBRIDGE

THE UNIVERSITY

DEPARTMENT OF EDUCATION

S.S.R.C. STUDENTSHIPS

Suitably qualified graduates intending to pursue research in Education are invited to apply for nomination for S.S.R.C. Studentships tenable from October 1, 1977, for two years in the first instance.

Further details from the Secretary of the Department of Education, 17 Trumpington Street, Cambridge, CB2 1PT, to whom letters of application with curriculum vitae, names of referees, and a brief statement of proposed research should be sent by April 15, 1977.

BRADFORD

THE UNIVERSITY

S.S.R.C. RESEARCH STUDENTSHIPS IN SOCIOLOGY

Applications are invited as early as possible from candidates holding or expecting to obtain this summer a first or upper second class honours degree in Sociology for two-year studentships commencing October, 1977.

Further details and application forms from Mr. G. M. Littlejohn, Postgraduate School of Social Sciences, University of Bradford, West Yorkshire BD7 1DP, quoting reference RS/SOC/TH.

EDINBURGH

THE UNIVERSITY

DEPARTMENT OF ARTIFICIAL INTELLIGENCE

S.S.R.C. RESEARCH STUDENTSHIP

Applications for an earmarked S.S.R.C. Research Studentship are invited from graduates with a First or Second Class Honours degree who wish to read for a Ph.D. degree. Preference will be given to candidates with a degree in Education or Psychology, or graduates in Computer Science or Mathematics with a strong interest in educational problems. Teaching or other practical experience would also be an advantage.

The successful applicant will participate in a research project to investigate children's learning, using computer-based methods. It also provides opportunities for work with handicapped children.

Further particulars can be obtained by letter to: Dr J. Howe, Department of Artificial Intelligence, University of Edinburgh, Forrest Hill, Edinburgh, EH1 2QL.

LEEDS

THE UNIVERSITY

PROCTER DEPARTMENT OF FOOD SCIENCE

M.Sc. STUDENTSHIP IN FOOD ENGINEERING/FOOD SCIENCE

Applications are invited from suitably qualified U.K. Honours graduates to undertake a 12-month course starting in October, 1977, leading to an M.Sc. degree either in Food Engineering or in Food Science.

The Studentship is sponsored by RHM Research Limited and covers full fees and maintenance. Further details of the courses can be obtained from Professor David S. Robinson, Procter Department of Food Science, The University, Leeds LS2 9JT.

Prospective candidates should submit in duplicate details of their qualifications, curriculum vitae and the names of two referees, not later than April 4th, 1977.

MIDDLESEX

BRUNEL UNIVERSITY

DEPARTMENT OF SOCIOLOGY

GRADUATE STUDIES IN SOCIOLOGY

M.Phil. AND Ph.D. DEGREES

The Department of Sociology invites applications for an S.S.R.C. research studentship from candidates with, or about to get, a good honours degree in Sociology. The department is keen to attract students to work in one of the following fields: Sociology of Culture (i.e., Religion, Art and Law), Communications, Youth, Science, Organisations or Historical Sociology. Graduate work consists predominantly of supervised reading and research, but a seminar course and Methodology course [illegible] for graduate students in their first year of research.

Applications (by May 1st, 1977) to the Graduate Tutor, Department of Sociology, Brunel University, Uxbridge, Middlesex.

WARWICK

THE UNIVERSITY

RESEARCH STUDENTSHIPS IN SOCIO-LEGAL STUDIES

Applications are invited for two S.S.R.C. financed research studentships in socio-legal studies (tenable for two years (extendible in some cases for a third year) from October 1977.

Applicants must normally have (or expect to obtain this summer) a first degree in law, and will be required to register for the School of Law.

Application forms from the Academic Registrar, University of Warwick, Coventry CV4 7AL, quoting Ref. No. [illegible], to be returned not later than June 30th, 1977.

Polytechnics

PLYMOUTH POLYTECHNIC

Lecturers are required for new posts in these disciplines.

School of Management and Business Studies

ACCOUNTANCY — 2 posts at LII, SL or PL* — an ability to teach Law would be an advantage for one of these posts.

MARKETING — LII or SL* — an ability to teach Economics would be helpful though not essential.

School of Mathematical Sciences

MATHEMATICS / **STATISTICS** — 2 posts at LII — to teach on a wide range of courses throughout the Polytechnic. *Research in a relevant area preferred.

School of Behavioural and Social Sciences

SOCIOLOGY — LII — Qualified in any field of sociology.

Salaries :

PL £5,940-£7,578
SL £5,031-£6,417
LII £3,279-£5,493
(all + £312 p.a. supplement)

*Grade of appointment will depend upon level of experience and qualification of appointee.

Applications are invited from qualified personnel with relevant professional and teaching experience.

Application forms to be returned by 15th April, 1977, can be obtained with further particulars from the Personnel Officer.

Drake Circus, Plymouth, Devon, PL4 8AA

Assistant, Overseas Centre

£2,724 to £3,126

This is a new post in a developing area and will be based at the Barking Precinct, Longbridge Road, Dagenham, Essex. He/she will assist the Overseas Liaison Officer arranging student placements both abroad and in Britain ; develop, monitor and assist with the organisation of the overseas activities of NELP and provide a small amount of secretarial assistance to the BA Social Studies (Modern France) course.

Applicants should be able to work on their own initiative, be competent shorthand typists and preferably have a knowledge of French (German and/or Italian would be an added advantage).

The salary will be within the inclusive annual scale quoted depending on age, qualifications and experience.

If interested please contact the Personnel Office, 109 The Grove, Stratford E15 (Tel 01-555 0811, Ext 32), quoting reference A313/77 for further details and an application form.

Closing date : 12 April, 1977.

NELP North East London Polytechnic

BRISTOL POLYTECHNIC

Department of Construction & Environmental Health

PRINCIPAL LECTURER IN ENVIRONMENTAL HEALTH

Applications are invited for the above post.

Candidates should be graduates in Environmental Health or a related discipline, with appropriate professional qualifications and experience.

The successful candidate will be expected to play a leading role in the development of a degree course in Environmental Health. Previous teaching experience at this level is, therefore, essential.

The ability to contribute to research in the department would be advantageous.

Salary Scale. Principal Lecturer £5,940-£6,642 (bar)-£7,578 plus £312 supplement.

Further details and application forms (to be returned by 8 April, 1977) to Personnel Office, Bristol Polytechnic, Coldharbour Lane, Bristol BS16 1QY. Please quote Post Reference Number L53/111 in all communications.

PLYMOUTH POLYTECHNIC

School of Behavioural and Social Science

LECTURER II POLITICS

(PUBLIC ADMINISTRATION)

Salary, £3,279-£5,493 p.a. (+ £312 p.a. supplement) for teaching and developing a number of courses, including BSc Combined Studies, BA Social Policy and Administration, and the Certificate for Training in Social Work.

Applicants particularly welcomed with interests and expertise in Public Administration, Policy Analysis or Comparative Public Administration.

Application forms to be returned by 15th April 1977 can be obtained with further particulars from the Personnel Officer.

PLYMOUTH POLYTECHNIC DRAKE CIRCUS PLYMOUTH PL4 8AA

BRIGHTON POLYTECHNIC LEARNING RESOURCES

EDUCATIONAL DEVELOPMENT UNIT

GRAPHIC/PHOTOGRAPHIC DESIGNER

£2,781 to £5,605

Required to work with a team providing a wide range of educational development services to academic staff, and with specific responsibility for a central graphic, photographic and reprographic service. Ability and experience in designing and producing graphic / photographic materials for teaching and learning, essential.

Further details and application forms from Personnel Division, Brighton Polytechnic, Moulsecoomb, Brighton BN2 4GJ. Telephone 693655. Closing date April 5, 1977.

BRIGHTON

THE POLYTECHNIC

DEPARTMENT OF COMMUNICATION AND EUROPEAN STUDY

SENIOR LECTURER in ENGLISH AS A FOREIGN LANGUAGE required to develop all aspects of English language teaching for overseas students.

Applicants must be graduates with post-graduate qualification in TEFL and experienced in EFL teaching, course planning, administration.

Salary, £5,343 to £6,729.

Further details and application form are obtainable from the Personnel Division, Brighton Polytechnic, Moulsecoomb, Brighton, BN2 4GJ. Tel. (0273) 693655. Closing date : 8th April, 1977.

HATFIELD

THE POLYTECHNIC

LECTURER 2 in POLITICS

(Ref. 849)

An honours GRADUATE with an interest in either comparative politics or the politics of environmental policy is required from September 1, 1977, to teach introductory courses in politics and advanced courses in either of these specialist fields.

LECTURER 2 in SOCIAL POLICY

(Ref : 850)

Applicants should possess a good honours degree with a significant social policy component. There is scope for development of most special interests in social policy.

For both posts preference will be given to applicants with a higher degree and some experience of degree level teaching.

Salary Scale £3,279 to £5,031 (bar) to £5,950 plus £312 supplement and £130 local weighting per annum.

Further particulars and application forms available from the Staffing Office, The Hatfield Polytechnic, Box 109, Hatfield, Herts AL10 9AB or Telephone Hatfield 68100, Extension 309.

Closing date : April 12, 1977.

LONDON

CITY OF LONDON POLYTECHNIC

DEPARTMENT OF ECONOMICS AND BANKING

SENIOR LECTURER IN BANKING

Applications are invited from graduates in Economics, Business or Management Studies or allied disciplines who have a good record of practical banking experience.

The successful candidate will be required to contribute to the general teaching of this large Department as well as to the specialist courses leading to the examinations of the Institute of Bankers.

An important task will be to assist with the administration and active development of day and evening courses for bankers.

Sound teaching experience, an understanding of the changes taking place in the pattern of bank education and an interest in research will all be important factors in the selection of the successful candidate.

The salary scale, in accordance with the Burnham (FE) Report, is as follows: £5,343 to £6,267 (bar) £6,729 plus £402 London Allowance.

Further details and application forms may be obtained from the Assistant Secretary, City of London Polytechnic, Administrative Headquarters, 117-119 Houndsditch, London EC3A 7BU.

Closing date 30 April 1977.

LONDON S.E.18

THAMES POLYTECHNIC

SCHOOL OF MATHEMATICS, STATISTICS AND COMPUTING

SYSTEMS ANALYST COMPUTER SCIENTIST

A vacancy exists for a LECTURER II in the Division of Systems Analysis but the person APPOINTED may be assigned additionally to the Division of Computing and Numerical Mathematics according to his qualifications and experience.

The Divisions are part of the School of Mathematics, Statistics and Computing, which runs several degree and diploma courses, including a B.Sc. (Honours) Computer Science and an H.N.D. Computer Studies, both of which have studies in Data Processing and Computer Systems. These subjects are also components of many other courses.

Applicants should have good degrees, industrial experience in one or both of these areas and the ability to communicate successfully with students. Research experience would be an advantage.

Salary scale: Lecturer Grade II £3,963 to £6,307 gross inclusive.

Further particulars and form of application may be obtained from the Staffing Officer, Thames Polytechnic, Wellington Street, London, SE18 6PF, to whom completed applications should be returned by 19 April 1977.

MANCHESTER

THE POLYTECHNIC

HOLLINGS FACULTY

DEPARTMENT OF CLOTHING DESIGN AND TECHNOLOGY

LECTURER II IN CLOTHING PRODUCTION

The person appointed will join a team teaching on courses leading to supervisory, technological, and management appointments in the clothing industry.

A Clothing Institute, or equivalent qualification and some years experience in production management are desirable qualifications.

Salary scale: £3,279-£5,493 plus £312 p.a. annum supplement.

For application form, returnable by 13th April, 1977, please send a self-addressed envelope marked "RO/4" to the Secretary, Manchester Polytechnic, Lower Ormond Street, Manchester M15 6BX.

SHEFFIELD

CITY POLYTECHNIC

DEPARTMENT OF APPLIED SOCIAL STUDIES

SENIOR LECTURER IN APPLIED SOCIAL STUDIES/SOCIAL WORK

Applications are invited for this senior post in the Department. Applicants should hold a relevant degree and/or a professional social work qualification. The appointment of Senior Lecturer will carry senior and appropriate responsibilities for both teaching and aspects of administration within the degree course which includes the CQSW award, namely BA BA (Hons) Applied Social Studies. Experience in social work education is an important requirement.

Salary Scale £5,343 to £6,267 (bar) to £6,729.

Application forms and further details obtainable from the Personnel Officer, Sheffield City Polytechnic, Halfords House, Fitzalan Square, Sheffield S1 2BB, to whom completed forms should be returned within fourteen days.

SUNDERLAND

THE POLYTECHNIC

FACULTY OF ART AND DESIGN

STUDIO DEMONSTRATOR IN PRINTMAKING

(Salary £1,900)

This one-year appointment is effective from September 1, 1977.

Duties include 11 hours teaching with access to studio facilities during those periods outside of teaching hours.

An application form may be obtained from the Personnel Officer, Sunderland Polytechnic, Chester Road, Sunderland SR1 3SD, and should be returned as soon as possible.

TEESSIDE

THE POLYTECHNIC

DEPARTMENT OF MATHEMATICS AND STATISTICS

LECTURER II SENIOR LECTURER

A vacancy exists in this well established department, whose work includes courses for an M.Sc. in Applicable Mathematics and B.Sc. (Hons.) in Mathematical Sciences.

It is desired to appoint a person who can contribute to the postgraduate teaching and research in the areas of Applied Applicable Mathematics.

Salary : Lecturer II Senior Lecturer : £3,279 by £210 to £5,031 (efficiency bar) by £251 to £5,967 by £251 to £6,417 plus £312 supplement. Appointment will be made on the lower part of the scale.

Application forms and further particulars are available from The Staffing Section, Teesside Polytechnic, Borough Road, Middlesbrough, Cleveland TS1 3BA, and are returnable within 14 days.

WOLVERHAMPTON

THE POLYTECHNIC

DEPARTMENT OF LEGAL STUDIES

SENIOR LECTURER/LECTURER II IN LAW

Required from 1st September to teach on the B.A. Law degree courses (full-time and part-time) and on other degree and professional courses. Candidates should have a good honours degree and appropriate teaching experience. A higher degree or a professional qualification will be an advantage.

Salary Scale (under review). S/L £5,031 to £5,955 (bar) to £6,417 plus £312 supplement : L.II, £3,279 to £5,493 plus £312 supplement.

Application forms and further particulars from : The Establishment Officer, The Polytechnic, Wolverhampton, WV1 1LY.

Colleges of Further Education

LONDON

INNER LONDON EDUCATION AUTHORITY

SOUTH WEST LONDON COLLEGE

Tooting Broadway, S.W.17

Required from 1st September, 1977. Full time LECTURER, Grade I, specialising in BUSINESS or MANAGEMENT STUDIES to teach up to 8 hours per week and during the balance of hours to act as the Academic Personal Assistant to the Principal.

The successful candidate would transfer to normal full time teaching after 2-3 years.

This appointment may be of particular interest to anyone embarking upon a new career in education.

Salary Scale : On an incremental scale within the range £2,469 to £4,277 (plus £312 supplement and £402 Inner London Allowance), starting point depending upon qualifications, training and experience.

Assistance may be given towards household removal expenses. Further details and forms of application returnable within 14 days from Senior Administrative Officer, South West London College, Tooting Broadway, London, S.W.17. (T.134).

Adult Education

QUALIFIED ESL/EFL TEACHER

needed South East London part-time (afternoons), ILEA rates.

Apply GCNA, Old Town Hall, Polytechnic Street, S.E.18. Telephone : 01-855 7191.

Colleges of Art

Chelsea School of Art

Manresa Road, SW3 6LS

Head of Department of Graphic Design

(Grade III)

The governors wish to appoint a Head of Department of Graphic Design in succession to Mr Edward Wright.

The post will become vacant on September 1, 1977. Applicants should preferably have had wide experience as practising Graphic Designers and have contributed to Graphic Design education at a high level.

The department offers a B.A.(Hons.) degree level course of three years' duration and at present enrols 20 students per annum.

Salary within the scale £6,231-£7,023 plus £312 supplement and Inner London allowance of £402.

ilea — *Further particulars and application forms from the Senior Administrative Officer, Chelsea School of Art, Manresa Road, SW3 6LS, returnable within 14 days of the publication of this advertisement.*

Colleges of Higher Education

SOUTH GLAMORGAN

(County of)

SOUTH GLAMORGAN INSTITUTE OF HIGHER EDUCATION FACULTY OF ART AND DESIGN

DEPARTMENT OF FINE ART

Applications are invited for the following teaching posts, to commence in September, 1977, for a period of one year.

TWO JUNIOR FELLOWSHIPS in FINE ART (salary half Lecturer II, £1,639 to £2,746 plus £156 per annum).

Application forms and further particulars may be obtained from the Deputy Principal, South Glamorgan Institute of Higher Education, Llandaff Buildings, Western Avenue, Cardiff CF5 2YB, to whom they should be returned within 14 days of the appearance of this advertisement.

F. J. Adams, Director of Education, Education Offices, Kingsway, Cardiff.

Colleges and Institutes of Technology

DONCASTER

DONCASTER METROPOLITAN INSTITUTE OF HIGHER EDUCATION

DEPARTMENT OF SCIENCE AND MATHEMATICS 76/4 3

Required as soon as possible, a LECTURER I to teach MATHEMATICS up to and including fourth year B.Ed. Honours Standard. Candidates should have sound academic qualifications in Analysis or Number Theory and, preferably, a Higher Degree. Ability to assist in professional work in the Teacher Education Programme would be an advantage.

Salary scale: £2,469 to £4,277 plus £312 supplement.

Placing on this scale is dependent on qualification and experience.

Please send a stamped addressed envelope for application forms which are obtainable from the Principal, Doncaster Metropolitan Institute of Higher Education, Waterdale, Doncaster DN1 3EX.

REMINDER

Copy for Classified Advertisements in the THES should arrive not later than 10.30 am Monday preceding the date of publication

Appointments Wanted

TEACHER/LECTURER

(Licencié-ès-Lettres et Maître-ès-Lettres completing a Ph.D.) seeks post. References available. Seven years teaching experience in London. Write Box 0841 V, THES, The Times, WC1X 8EZ

Courses

University of Wales

UWIST

DEGREE OF M.Ed. TEACHING OF ENGLISH AS A FOREIGN LANGUAGE

with

(Jointly with University College, Cardiff)

Applications are invited from graduates with appropriate teaching qualifications and/or experience for admission in October, 1977, to a one-year or two-year course leading to the above-mentioned award of the University of Wales.

The course will include the Teaching of English as a Foreign Language (phonetics, linguistics, methodology), and a topic in Education (the latter studied at UCC, Cardiff). Candidates will take a written examination and submit a dissertation.

Further details may be obtained from the Academic Registrar, UWIST, Cardiff CF1 3NU.

HATFIELD

COMPUTER EDUCATION AT THE HATFIELD POLYTECHNIC

POSTGRADUATE DIPLOMA IN COMPUTER EDUCATION

A two-year part-time course designed for teachers and lecturers leading to a CNAA Diploma. The course gives the opportunity of specialising in either the teaching of computing or in the use of the computer as a teaching aid.

The course requires attendance on Wednesday afternoons and evenings during the first year and an evening only in the second year.

Further details from School Administrator, School of Information Sciences, The Hatfield Polytechnic, P.O. Box 109, Hatfield, Herts. Tel. Hatfield 68100, ext. 331.

MIDDLESEX

BRUNEL UNIVERSITY

Uxbridge

PART-TIME POSTGRADUATE COURSE IN ECONOMICS

The Department offers a two year course leading to an M.A. in Economics. Students are required to attend for at least one full day a week. The programme aims to provide advanced professional training to economists at work in education, government, or industry. Applications are also invited for a full-time (one year) course for the M.A.

Applicants should have a good honours degree in Economics. Further information and application forms may be obtained from Miss J. Jude, Department of Economics, Brunel University, Uxbridge, Middlesex UB8 3PH.

Administration

Monitoring Contract For SSRC Open Door Research Scheme

The Social Science Research Council proposes to issue a contract to monitor its new Open Door Research Scheme.

The Council has recently launched the Open Door Research Scheme for the generation of problem oriented research proposals in the area of management and industrial relations. The object of the scheme is to encourage the identification of research problems, relevant to their needs, by groups of managers, institutions, companies, trade unions, and employers.

Advice will be given to those putting up proposals by experienced researchers acting as consultants. The Contract is for the monitoring of these advisory discussions so as to improve the understanding of the way in which researchers and practitioners interact, and to report on the progress of the Open Door Research Scheme.

Applications are therefore being invited from experienced research groups. The Contract will be for up to three years, at a rate to be negotiated. It will include provision for staff costs, travel and subsistence typing, postage, etc.

Further information and details of the Open Door Research Scheme can be obtained from **Chris Caswill, Secretary of the Management and Industrial Relations Committee, SSRC, 1 Temple Avenue, London EC4Y 0BD (telephone 01-353 5252)**, to whom written proposals must be sent by 6th April, 1977.

OXFORD LOCAL EXAMINATIONS

Appointment of Assistant to the Secretaries/Assistant Secretary

The Delegates intend to make an appointment, as an addition to the present staff of a person suitably qualified to deal with work in the areas of Design, Technology, Craft and other technical subjects, to begin work on September 1, 1977. All applicants must have graduate or equivalent qualifications; teaching experience is desirable.

The appointment will be made at the level of either Assistant to the Secretaries or Assistant Secretary. For appointment as Assistant to the Secretaries, for which the salary scale, according to age and experience, runs from £2,904 rising by annual increments to a maximum of £5,219, applicants must be at least 24 years of age. For appointment as Assistant Secretary, for which the salary scale, according to age and experience, runs from £3,702, rising by annual increments to a maximum of £7,087, applicants must be at least 28 years of age. The level at which the appointment is made will be decided in the light of the qualifications and experience of the successful applicant; the age of the applicant will not be the determining factor.

Graduate staff are required to belong to the appropriate superannuation scheme in operation in the University.

Further particulars, and forms of application, to be returned by April 18, 1977, may be obtained from the Secretary of Local Examinations, Elvert Place, Summertown, Oxford OX2 7BZ.

EQUAL OPPORTUNITIES COMMISSION

HIGHER EXECUTIVE OFFICER

(Principal Information Officer)
Salary Scale £3,399 to £4,788 plus £312 London Supplement

Applications are invited from suitably qualified and experienced persons for the above post of Higher Executive Officer (Information) on secondment or as a permanent recruit to the Information Section of the Commission under the Commission's Director of Information Officer. This is a senior post in the Commission's Information Section dealing with developing educational initiatives and undertaking research activities in the context of the new legislation.

Candidates should have experience at a suitable level in at least one of the following areas for example:

(a) as a responsible officer in HM Civil Service or the Department of Education and Science, or the Scottish Education Department; or

(b) administrative and/or professional experience in a school or college at a senior level; or

(c) experience in the vocational training of young people, or in the careers service.

The successful candidate should be interested in undertaking policy work of a research nature.

Administrative ability and the capacity to organise a section effectively will be essential qualifications. Experience of working with the media would be an advantage but is not essential.

The salary will be within the Higher Executive Officer scale, but the starting salary will depend on the qualifications and experience of the successful candidate. Initial appointment will be for a period of three years, but there is a possibility that this may be extended.

Further particulars may be obtained from the Commission's Personnel Officer, Equal Opportunities Commission, Overseas House, Quay Street, Manchester M3 3HN. Closing date for receipt of completed applications 8th April, 1977. It is hoped that interviews will be held in April.

THE OPEN UNIVERSITY

ADMINISTRATIVE ASSISTANT

Applications are invited for a post of Administrative Assistant in the Accounting Services Division, Central Office at Walton Hall, Milton Keynes. Salary according to qualifications and experience within the scale (AA) Grade 1A Scale, £3,903 to £5,637 per annum.

The duties of the post will be related to support of the development of the University's policy and practice in the field of tuition. The successful candidate will be expected to have good academic qualifications, an ability to work quickly, and a commitment to the educational objectives of the University. Previous administrative experience in an educational context would be an added advantage.

Further particulars and application forms are obtainable by postcard request (please quote ref. AA/Personnel/Guardian) from the Personnel Department, The Open University, P.O. Box 76, Walton Hall, Milton Keynes, MK7 6AA. Tel.: Milton Keynes 66866. Closing date for applications 8th April, 1977.

SUSSEX

THE UNIVERSITY

Assistant Registrar (Grade 7) in ADMINISTRATION

Applications are invited for the post of ASSISTANT SECRETARY in the Administration Section of the Secretary's Area of the Administration. The successful applicant will work initially in the Academic Secretariat and will be responsible for duties of a wide and varied nature.

Salary scale: £3,903 rising by annual increments to £5,637 per annum.

Further particulars and application forms are available from the Establishment Officer, University of Sussex, Brighton BN1 9RH, to whom completed applications should be returned. Applications should reach the University not later than 30th April, 1977.

CARDIFF

UNIVERSITY COLLEGE

DEPARTMENT OF INDUSTRIAL MANAGEMENT STUDIES

SECRETARY TO PERSONNEL ADMINISTRATION

By Examination and Interview

Application invited from candidates wishing to undertake secretarial duties in a personnel administration environment. The successful candidate will be required to undertake a wide range of duties, including the preparation of minutes and agendas, and the maintenance of records.

Interviews and applications should be addressed to Personnel Officer, University College, P.O. Box 78, Cardiff CF1 1XL, as soon as possible.

Classified Advertisements
To advertise in the THES phone John Ladbrook 01-837 1234
THE TIMES
Higher Education SUPPLEMENT
New Printing House Square, P.O. Box 7, Gray's Inn Road, London WC1X 8EZ

General Vacancies

the College of Ripon & York St John

TEMPORARY LECTURESHIPS IN BIOLOGY AND IN PHYSICAL SCIENCES

Applications are invited from well-qualified men and women for the following temporary appointments in this Church of England Voluntary College of Higher Education (1,600 men and women). The appointments will be from 1st September 1977 to 31st August 1978. The College, which was formed in 1975 through the amalgamation of The College, Ripon with St. John's College, York, offers courses leading to the award of the Certificate in Education, the Diploma of the British Association of Occupational Therapists, the Diploma in Higher Education, the Post-graduate Certificate in Education, the BEd and BA/BSc (Collegiate) degrees of the University of Leeds.

TEMPORARY LECTURER GRADE II (BIOLOGY)

The successful applicant will be expected to teach courses at Honours degree level. A particular interest in zoology with a bias towards animal physiology and nutrition is required. The appointment will be based mainly on the York campus.

TEMPORARY LECTURER GRADE II (PHYSICAL SCIENCES)

The successful applicant will participate in the teaching of courses in Physics, Physical Sciences and, possibly, Mathematics which contribute to BA/BSc(Hons) and BEd(Hons) degree programmes. The appointment will be based mainly on the York campus.

The appointments will be at Lecturer Grade II scale (£3,279 plus £312 to £5,493 plus £312). Further details and application forms may be obtained from The Principal, The College of Ripon and York St. John, Lord Mayor's Walk, York YO3 7EX, to whom completed application forms should be returned to arrive not later than MONDAY, 4th APRIL, 1977.

HTV

HTV (the Independent Television Company for Wales and the West of England) proposes to appoint an

ASSISTANT EDUCATION OFFICER

to be based at its Bristol Studios. The appointment entails assisting the Education Officer in liaising with Schools and other educational institutions in the HTV region, and in mounting courses and conferences relating to the media.

HTV not only promotes and follows up Independent Television's Schools programmes in the region, but also makes a significant contribution nationally with programmes for parents and teachers. The successful applicant will need to have a sound teaching background, and a wide knowledge of educational developments.

Salary circa £4,500.

For further information and application form, write to:— The Personnel Officer, HTV Television Centre, Bath Road, Bristol BS4 3HG.

OVERSEAS TEACHING POSTS

HEAD, EDUCATIONAL TECHNOLOGY ENGINEERING *(Iran)*

Jundi Shapur University, Ahwaz.

To establish, organise and manage new department to run postgraduate courses initially, later undergraduate and technician courses. PhD or MSc and at least 5 years' relevant experience.

Salary: £10,760-£10,700 p.a. (approx.).

Benefits: Housing allowance; one year contract, renewable.

Return fares are paid. Local contract is guaranteed by the British Council.

Please write, briefly stating qualifications and length of appropriate experience, quoting reference number and title of post for further details and application form to The British Council (Appointments), 65 Davies Street, London W1Y 2AA.

THE BRITISH COUNCIL

Overseas

UNIVERSITY OF MALAWI THE POLYTECHNIC

Principal

A constituent College of the University of Malawi, situated between Blantyre and Limbe, the Polytechnic caters for approximately 900 day and 1,400 evening class students. It offers 3-year full-time post School Certificate University Diploma courses in Mechanical, Electrical and Construction Engineering, Public Health Inspection, Laboratory Technology and Business Studies and a variety of full-time block release and sandwich courses at craft and technician level under separate Board of Governors. The extension of the work in Engineering and Accountancy to ordinary degree level is now being considered.

Applications are invited for the post of Principal. Candidates should have appropriate academic qualifications, substantial teaching and administrative experience, and a breadth of interests appropriate to the range of the Polytechnic's work. The post will carry professorial status and salary and an ex-officio seat on the Senate.

Salary: £8,110 to £9,735 p.a.

(including a supplement, normally tax-free, payable by the British Government to citizens of the U.K., which is reviewed annually).

Appointment on contract to the University for two years initially. 16⅔ per cent terminal gratuity, subsidised housing, free passages, education allowances and children's holiday visit passages, biennial overseas leave. An interest-free car loan of £1,200 and appointments grant of £300 are payable in certain circumstances.

Please write for further details, and an application form to Recruitment Unit, TETOC (Technical Education and Training Organisation for Overseas Countries), 36/37 Grosvenor Gardens, London SW1W 0EB. Closing date for receipt of applications 19th April, 1977.

tetoc

Overseas

KELVIN GROVE COLLEGE OF ADVANCED EDUCATION BRISBANE, AUSTRALIA

Kelvin Grove College of Advanced Education is autonomous College specializing in the preparation of Primary, Pre-School and Secondary teachers. In addition it offers a wide range of in-service courses for teachers which include a four-year degree programme from 1977. (The College overlooks the city and is positioned two kilometres from its business centre. Student enrolment in 1977 is approximately 2,000.)

A vacancy in the Department of Education will occur in July, 1977, for a

LECTURER/SENIOR LECTURER IN CURRICULUM STUDIES

REF. NO. 77/A/6

Lecturing commitments will be predominantly with teachers undertaking in-service diploma and B.Ed. degree programmes. Applicants should have high academic qualifications and successful teaching experience. The successful candidate would be expected to contribute substantially to course developments within the College and in liaison with schools.

The appointment will be made within the following salary ranges in accordance with qualifications and experience:

Lecturer III	— $11,851-$13,667 per annum
Lecturer II	— $13,850-$15,925 per annum
Lecturer I	— $16,314-$18,389 per annum
Senior Lecturer II	— $18,764-$20,170 per annum
Senior Lecturer I	— $20,828-$22,810 per annum

Applications should be received within 21 days of advertisement.

Application forms and further details are available from the Registrar, Kelvin Grove College of Advanced Education, Victoria Park Road, Kelvin Grove, Brisbane, Queensland, Australia. 4059.

R. W. BROWNLIE, ACTING REGISTRAR

KELVIN GROVE COLLEGE OF ADVANCED EDUCATION BRISBANE, AUSTRALIA

LECTURER

BUSINESS STUDIES/COMMERCIAL DEPARTMENT

REF. NO. 77/A/3

Applicants should have a strong background in at least two of the following areas, together with appropriate academic qualifications and a record of successful teaching experience.

Accounting/Data Processing
Economics
Typewriting
Pitman Shorthand

The successful applicant will be required to commence duty at the beginning of July, 1977.

The appointment will be made within one of the following salary ranges in accordance with qualifications and experience.

Lecturer III—$11,851-$13,667 per annum
Lecturer II —$13,850-$15,925 per annum
Lecturer I —$16,314-$18,389 per annum

Applications close 31st March, 1977.

Application forms and further details are available from the Registrar, Kelvin Grove College of Advanced Education, Victoria Park Road, Kelvin Grove, Brisbane, Queensland, 4059.

E. F. McCARTHY, REGISTRAR

Overseas continued

UNIVERSITY OF NATAL

Department of Divinity Pietermaritzburg

Applications are invited from suitably qualified persons for appointment to the post of

Senior Lecturer in Divinity

The salary scale attached to the post is:

R8,820 by R360 to R9,900 by R450 to R11,250, plus 10 per cent pensionable allowance per annum.

The commencing salary notch will be dependent on the qualifications and experience of the successful applicant. In addition, an annual vacation savings bonus up to R260 for married men and R130 for women and single men is payable, subject to Treasury regulations.

Application forms, further particulars of the post and information on pension, medical aid, staff bursary, housing loan and subsidy schemes, long leave conditions and travelling expenses on first appointment are obtainable from the Registrar, University of Natal, PO Box 375, Pietermaritzburg, 3200, with whom applications, on the prescribed form, must be lodged not later than April 25, 1977, quoting reference PMB 9/77.

UNIVERSITY OF NATAL

Department of Accountancy Pietermaritzburg

Applications are invited from suitably qualified persons for appointment to the post of

Senior Lecturer in Accountancy

Applicants need not necessarily be Chartered Accountants but such a qualification shall be an advantage. An interest in quantitative methods will be an additional advantage.

The salary scale attached to the post is: R8,820 x 360—R9,900 x 450—R11,250 plus 10 per cent pensionable allowance per annum.

A subvention is payable by the Public Accountants' and Auditors' Board at its discretion to Chartered Accountants who are engaged full-time in lecturing accountancy students at South African Universities.

The commencing salary notch will be dependent on the qualifications and/or experience of the successful applicant. In addition, an annual vacation savings bonus up to R260 for married men and R130 for women and single men is payable, subject to Treasury regulations.

Application forms, further particulars of the post and information on pension, medical aid, staff bursary, housing loan and subsidy schemes, long leave conditions and travelling expenses on first appointment are obtainable from the Registrar, University of Natal, P.O. Box 375, Pietermaritzburg, 3200, with whom applications, on the prescribed form, must be lodged not later than May 23, 1977 quoting reference PMB 12/77.

UNIVERSITY OF NATAL

Department of German Pietermaritzburg South Africa

Applications are invited from suitably qualified persons for appointment to the posts of

Lecturer/Senior Lecturer in German

The salary scales attached to these posts are:

(i) Lecturer: R6,300 x 360—9,180, (ii) Senior Lectureship: R8,820 x 360—9,900 x 450—11,250; plus 10 per cent pensionable allowance per annum. Applicants should indicate whether they are applying for the lectureship or senior lectureship or both.

The commencing salary notch will be dependent on the qualifications and experience of the successful applicant. In addition, an annual vacation savings bonus up to R260 for married men and R130 for women and single men is payable, subject to Treasury regulations.

Application forms, further particulars of the post and information on pension, medical aid, staff bursary, housing loan and subsidy schemes, long leave conditions and travelling expenses on first appointment are obtainable from the Registrar, University of Natal, P.O. Box 375, Pietermaritzburg, 3200, with whom applications, on the prescribed form, must be lodged not later than April 18, 1977 quoting reference PMB 8/77.

Assistant Translators

Brussels or Luxembourg

The Commission of the European Communities is organising an open competition on the basis of tests to draw up a reserve list of Assistant Translators, of Danish, Dutch, English, French, German and Italian to translate texts of a legal, economic administrative and technical nature.

Candidates, who will be required to translate into one of these languages (normally their mother tongue), should have an extensive knowledge of two of the other languages specified with the following restriction.

Candidates translating into:
(i) Danish, English or German must offer French
(ii) French or Italian must offer German
(iii) Dutch must offer English.

Candidates should be University graduates up to age 35. Full details and the obligatory official application form are contained in the Official Journal of The European Communities No. C71 dated 22 March 1977 which can be obtained from:

Information Office of The European Communities
20 Kensington Palace Gardens, London W8 4QQ
4 Cathedral Road, PO Box 15, Cardiff CF1 1WF
7 Alva Street, Edinburgh EH2 4PH

Closing date for receipt of completed applications 27 April 1977.

The Commission of the European Communities

ISRAEL

BIRZEIT UNIVERSITY

an independent Arab private university in the occupied West Bank, has positions open in the following fields for the academic year 1977/78: Accounting, Anthropology, Business Administration, Chemistry (Physical and Inorganic), Economics, Electrical Engineering (TEFL), Literature and Linguistics, Humanities (ancient and Medieval Mashemitic civilisations), Statistics, Mathematics (Algebra), Physics (Experimental and Theoretical), Psychology (Experimental), Sociology (Methodology and Demography).

English is the basic language of instruction.

Candidates should have a Ph.D., preferably, or at least a master's degree with teaching experience.

Salary for M.A. is $5,400 and for Ph.D. $7,000 and up, according to experience. Additional summer teaching available with salaries ranging from $3000 to $3,000 for the session. Fringe benefits include relocation allowance (15 per cent of salary), round trip air transportation is also provided. Only unmarried applicants will be acknowledged.

Applications should be addressed to Dr. [illegible], Birzeit University, Birzeit, West Bank, via Israel.

THE UNIVERSITY OF BERGEN, NORWAY

Lecturer in British Literature

Applications are invited for the post of university lecturer/senior lecturer in British literature in the Department of English, the University of Bergen. The post is vacant from 1st August, 1977. The person appointed will be expected to teach up to 10 hours per week, and should have an honours degree in English and teaching experience at university level. Knowledge of Norwegian is desirable, but not a requirement. Salary scale, within the range of Nkr 76,893 and Nkr 104,152. The position qualifies for inclusion in the state pension scheme. Applications naming two referees and including copies of published work should be sent to:—

Personnel Department, The University of Bergen, Box 25, 5014 Bg-D, Norway

within 15th April, 1977.

Further particulars may be obtained from Professor Barbara [illegible], Department of English, the University of Bergen.

Courses continued

BRISTOL

THE UNIVERSITY

Courses of Advanced Study for the Degree of M.Ed.

Session 1977-78

The following one-year courses will be offered in the DEPARTMENTS OF CLASSICAL LANGUAGES, GERMAN and THEOLOGY and RELIGIOUS STUDIES starting in October, 1977:

CLASSICS:

Late Roman Studies.
Aspects and Australian Prehistory.

ENGLISH:

Medieval English Literature (1350-1400).

FRENCH:

French Classical Drama and Theatre History.

GERMAN:

20th Century German Drama.

THEOLOGY AND RELIGIOUS STUDIES:

(1) Problems of Biblical Interpretation in Modern Study.
(2) Religious Thought and Society in the Nineteenth Century.
(3) Political Theology.
(4) The Study of Religion in Relation to Society.

Normal entrance requirement: an honours degree in an appropriate subject. Applicants for all courses (except those in Theology) will be considered who have a knowledge of Greek sufficient to undertake a course in Theology at Honours degree level. Applicants for the Theology courses must have a knowledge of Greek sufficient to undertake a course in Theology at Honours degree level.

Applications (four copies) together with two testimonials should be sent to the Secretary, Department of Education, 19 Berkeley Square, Bristol BS8 1HH, from whom further particulars may be obtained. Applications should be received by 30th April, 1977.

General Vacancies

TRAINING STAFF

CAP is Britain's largest independent company selling DIY products, employing over 600 staff in the UK and Europe. 10 per cent training is carried out by a full time training section specialists with assistance from consultancy and management firms training requirements. We now wish to extend this function to augment our existing programme.

Both lecturers will assist with instruction of new staff on technical subjects and with the management of the training programme. Our training programme includes in-house courses, distance learning packages, multi-media development and project administration.

The first position would suit someone currently specialising in lecturing basic product knowledge with limited management experience. He or she should be aged 25-35 and have a good general education and be keen to become involved in management. The salary range is £5,500 to £6,500 + car. Inner London Weighting is dependent on previous experience and qualifications.

The second opening requires a technical consulting background in programming, preferably with experience of operating and supporting COBOL or RPG II systems. The person will also be responsible for training and supporting users in the use of packages and programming languages. The salary range is £5,500 to £6,500 + car. Inner London Weighting is dependent on previous experience and qualifications.

Fringe benefits include sick pay scheme, pension scheme, insurance, staff purchase scheme, subsidised canteen and free parking.

Please write, including details of previous employment, to Personnel Manager, Computer Analysis and Programmers Limited, Cap House, 9-12 Long Lane, London EC1A 9HA. Telephone 01-606 3030.

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To advertise in the THES phone John Ladbrook 01-837 1234
THE TIMES
Higher Education SUPPLEMENT
New Printing House Square, P.O. Box 7, Gray's Inn Road, London WC1X 8EZ

A "REVIEW OF NEW COURSES" FEATURE

will be published on

Friday, April 1, 1977

For further details of advertising please contact

John Ladbrook 01-837 1234

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Fly with Thomson Holidays on a holiday to remember in Barbados at a realistic price. Departures are from Gatwick on Saturdays from 16th April through until 26th November. 14 nights at the Golden Palms Apartments in April and May costs from as little as £285 pp (self catering).

See your local travel agent for the Thomson Caribbean brochure or ring your local Thomson office for details.

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